Novel Coronavirus 2019 (2019-nCoV)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for 2019-nCoV. It is the first national guidance issued for the novel coronavirus (2019-nCoV) and will be further developed into CDNA National Guidelines for Public Health Units 2019-nCoV (2019-nCoV SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

1. Case definition

Suspect case

As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the clinical criteria below.

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to Hubei Province, China in the 14 days before the onset of illness.

OR

Travel to agreed areas[*] of human-to-human transmission, or a declared outbreak, within 14 days before onset of illness.

OR

- Close contact (see Contact definition below) in 14 days before illness onset with a case of 2019-nCoV.

Clinical criteria

- Fever or history of fever (>=38C) and acute respiratory infection (sudden onset of respiratory infection with at least one of: shortness of breath, cough or sore throat).

OR

- Severe acute respiratory infection requiring admission to hospital with clinical or radiological evidence of pneumonia or acute respiratory distress syndrome (i.e. even if no evidence of fever).

Confirmed case

A person who tests positive to a specific 2019-nCoV PCR test (when available) or has the virus identified by electron microscopy or viral culture, at a reference laboratory.

The case definition may have been updated since the publication of this guideline. Please check the case definitions webpage on the Australian Department of Health's website (www.health.gov.au/internet/main/publishing.nsf/Content/cdna-casedefinitions.htm) for the latest version.

2. Laboratory testing

Patients to be considered for 2019-nCoV testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide 2019-nCoV testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

[*] https://www1.health.gov.au/internet/main/publishing.nsf/Content/ohp-2019-nCoV-areas.htm

Transmission-based contact and airborne precautions must be used **when collecting respiratory specimens.** These include:

- Contact precautions, including close attention to hand hygiene.
- Airborne transmission precautions, including routine use of a P2/N95 mask/respirator, disposable gown, gloves, and eye protection.
- Collection in a single room with the door closed, or if in a hospital in a negative pressure room where available.
- If transfer of the confirmed case outside the negative pressure room is necessary, asking the patient to wear a “surgical” face mask while they are being transferred and to follow respiratory hygiene and cough etiquette.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for 2019-nCoV is not yet available.

See Appendix A for additional 2019-nCoV laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the 2019-nCoV public health unit checklist and the 2019-nCoV Investigation Form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.

- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide 2019-nCoV factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of 2019-nCoV, the requirements of isolation, contact details of the PHU and the infection control practices that can prevent the transmission of 2019-nCoV.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected, and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for 2019-nCoV. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have 2019-nCoV infection, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited person-to-person transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

Infection control measures should be those applicable to control the transmission of pathogens that can be spread by the airborne route. These measures are detailed in the Interim infection prevention and control advice for acute care hospitals relating to suspected Middle Eastern respiratory syndrome coronavirus (MERs-CoV) infections and can be applied to circumstances with suspected cases of 2019-nCoV.

In summary, transmission-based precautions for suspected and confirmed cases should include:

- Placement of cases in a negative pressure room with an ensuite bathroom, if available, or in a single room from which the air does not circulate to other areas.
- Airborne transmission precautions, including routine use of a P2 respirator/N95 mask where available otherwise a surgical mask is sufficient for routine care, long sleeved disposable gown, gloves, and eye protection when entering a patient care area.

- Contact precautions, including close attention to hand hygiene.
- If transfer of the confirmed case outside the negative pressure room is necessary, asking the patient to wear a “surgical” face mask while they are being transferred and to follow respiratory hygiene and cough etiquette.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of 2019-nCoV is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Contact management

As there remain gaps in the understanding of infectivity of 2019-nCoV cases and transmission modes, the definition of contacts and their public health management is based on observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding 2019-nCoV infection in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring greater than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or the sharing of a closed space with a symptomatic confirmed case for a prolonged period (e.g. more than 2 hours).

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE.

- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Face-to-face contact for more than 15 minutes with the case in any other setting not listed above.

Contact needs to have occurred within the period extending from the day of onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed 2019-nCoV case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with 2019-nCoV infection they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected 2019-nCoV case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a symptomatic confirmed 2019-nCoV case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a symptomatic confirmed case of 2019-nCoV. If a crew member is the symptomatic 2019-nCoV case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a symptomatic confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for 2019-nCoV infection is not recommended for asymptomatic contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of 2019-nCoV and provided with a 2019-nCoV Factsheet. They should be advised to self-isolate if they develop symptoms, and to immediately notify their public health unit and, if appropriate, their facility infection control unit (i.e. for healthcare workers).

Isolation and restriction

Close contacts

Home quarantine of asymptomatic contacts is not routinely recommended, but people identified as close contacts are advised to monitor their health for 14 days after the last possible contact with a symptomatic confirmed 2019-nCoV case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a symptomatic confirmed 2019-nCoV case.

Close contacts should be advised to immediately telephone the public health unit to arrange medical attention if they develop symptoms such as fever, respiratory symptoms (including coughing and shortness of breath), headache, muscle pain or diarrhoea.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contacts should also be advised to not travel internationally for 14 days after the last close contact with a confirmed case of 2019-nCoV, and any travel within Australia during this period should be subject to discussion with the public health unit.

Close contacts should be excluded from schools and sensitive occupations or settings such as health care, aged care, or child care during the 14 days after last unprotected contact with a case.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should not undertake work in a healthcare setting for 14 days following the last possible contact with the case. Home quarantine is not routinely recommended during this period if these individuals remain asymptomatic, but some restrictions may be recommended based on a risk assessment of the particular circumstances.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognized that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed 2019-nCoV cases.

CDNA will continue to monitor the emerging evidence around 2019-nCoV transmission risks in healthcare settings and revise these recommendations as needed.

Management of symptomatic contacts

If fever, respiratory symptoms or other symptoms consistent with 2019-nCoV infection develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected 2019-nCoV cases, with urgent testing for 2019-nCoV infection undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for 2019-nCoV infection can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for 2019-nCoV by PCR will still need to be monitored for 14 days after their last contact with a confirmed 2019-nCoV case and may require re-testing.

Appendix A 2019-nCoV Laboratory testing information

Laboratory testing for 2019-nCoV is likely to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a reference laboratory with capacity to test for 2019-nCov. As co-infection is possible, initial testing protocols should include testing for 2019-nCoV in patients with epidemiological risk, even where another infection is shown to be present. As more information accumulates regarding the risk of dual respiratory viral infections this may be reviewed.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
    - oropharyngeal: swab the tonsilar beds, avoiding the tongue
    - place swabs back into the accompanying transport media

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

Given that for SARS-CoV and MERS-CoV there is evidence that lower respiratory tract specimens contain the highest viral loads, it is therefore advised that lower respiratory tract specimens should be collected where possible for 2019-nCoV testing. Repeat testing (especially of lower respiratory tract specimens) in compatible cases should be performed if initial results are negative and there is a high index of clinical suspicion.

Serology

Where possible, serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with a convalescent serum collected 3 or more weeks after acute sample collection. If no acute sample was collected, a single serum sample collected 14 or more days after symptom onset may be tested.

Handling of specimens in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-viral pathology testing.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is done for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for processes potentially generating aerosols. Attempted viral culture, which would require higher levels of biocontainment would not routinely be attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with 2019-nCoV testing capacity requesting ‘2019-nCoV Coronavirus’ testing.

As stated above, clinician liaison with jurisdictional public health officers is essential to coordinate referral & testing.

As above, standard protocols should be used for sample packaging and transport as diagnostic samples for testing.

2019-nCoV specific testing

NAT using reverse-transcriptase polymerase chain reaction (RT-PCR) is the method of choice for detection of 2019-nCoV. Diagnostic capability for 2019-nCoV is expected to evolve rapidly, hence will be described here only in broad terms. Protocols will be available from the WHO in January 2020, and include PCR followed by specific probe detection of amplicons. The intial PCR detects 2019-nCoV and SARS-CoV, but not commonly circulating coronaviruses usually detected by commercial assays (eg NL63, 229 strains).

Several Australasian Public Health Laboratory Network (PHLN) reference laboratories currently offer PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these have been mapped against the promulgated nucleic acid sequence of the 2019-nCoV, and are expected to detect it on that basis. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach.

Specific PCR primer sets to detect the 2019-nCoV are becoming available, however the majority, including those available through WHO will also detect other zoonotic coronaviruses such as SARS coronavirus.

The 2019-nCoV is yet to be internationally available for use as a test positive control. Synthetic positive control material in the form of nucleic acid templates is becoming available through WHO/ European Viral Archive (EVAg). SARS-CoV may be used as an interim positive control for testing by PHLN member laboratories as an interim measure.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities.

No Quality Assurance Program (QAP) is currently available internationally specific to the 2019-nCoV, although QAPs are available in Australia for respiratory viruses including non-2019-nCoV coronaviruses. The RCPAQAP with Commonwealth support will introduce a 2019-nCoV specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during 2020.

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1. Case definition

Suspect case

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If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to Wuhan City (Hubei Province, China) in the 14 days before the onset of illness.

OR

Travel to an area* with evidence of sustained human-to-human transmission, or a declared outbreak, within 14 days before onset of illness.

OR

- Close contact (see Contact definition below) in 14 days before illness onset with a case of 2019-nCoV.

Clinical criteria

- Fever or history of fever (>=38C) and acute respiratory infection (sudden onset of respiratory infection with at least one of: shortness of breath, cough or sore throat).

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Transmission-based contact and airborne precautions must be used **when collecting respiratory specimens.** These include:

*List of areas will be attached to National Incident Room (NIR) new coronavirus 2019 (2019-nCoV) Situation Reports and publicly available at the Australian Government Department of Health website.

- Contact precautions, including close attention to hand hygiene.
- Airborne transmission precautions, including routine use of a P2/N95 mask/respirator, disposable gown, gloves, and eye protection.
- Collection in a single room with the door closed, or if in a hospital in a negative pressure room where available.
- If transfer of the confirmed case outside the negative pressure room is necessary, asking the patient to wear a “surgical” face mask while they are being transferred and to follow respiratory hygiene and cough etiquette.

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- Seek the treating doctor's permission to contact the case or relevant care-giver.
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- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

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A risk assessment should be undertaken for suspected cases who initially test negative for 2019-nCoV. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have 2019-nCoV infection, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

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Infection control measures should be those applicable to control the transmission of pathogens that can be spread by the airborne route. These measures are detailed in the Interim infection prevention and control advice for acute care hospitals relating to suspected Middle Eastern respiratory syndrome coronavirus (MERs-CoV) infections and can be applied to circumstances with suspected cases of 2019-nCoV.

In summary, transmission-based precautions for suspected and confirmed cases should include:

- Placement of cases in a negative pressure room with an ensuite bathroom, if available, or in a single room from which the air does not circulate to other areas.
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- Contact precautions, including close attention to hand hygiene.
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Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of 2019-nCoV is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

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As there remain gaps in the understanding of infectivity of 2019-nCoV cases and transmission modes, the definition of contacts and their public health management is based on observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

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Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding 2019-nCoV infection in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring greater than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or the sharing of a closed space with a symptomatic confirmed case for a prolonged period (e.g. more than 2 hours).

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.

- Face-to-face contact for more than 15 minutes with the case in any other setting not listed above.

Contact needs to have occurred within the period extending from the day of onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

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Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed 2019-nCoV case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with 2019-nCoV infection they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected 2019-nCoV case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

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- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a symptomatic confirmed 2019-nCoV case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a symptomatic confirmed case of 2019-nCoV. If a crew member is the symptomatic 2019-nCoV case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a symptomatic confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for 2019-nCoV infection is not recommended for asymptomatic contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of 2019-nCoV and provided with a 2019-nCoV Factsheet. They should be advised to self-isolate if they develop symptoms, and to immediately notify their public health unit and, if appropriate, their facility infection control unit (i.e. for healthcare workers).

Isolation and restriction

Close contacts

Home quarantine of asymptomatic contacts is not routinely recommended, but people identified as close contacts are advised to monitor their health for 14 days after the last possible contact with a symptomatic confirmed 2019-nCoV case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a symptomatic confirmed 2019-nCoV case.

Close contacts should be advised to immediately telephone the public health unit to arrange medical attention if they develop symptoms such as fever, respiratory symptoms (including coughing and shortness of breath), headache, muscle pain or diarrhoea.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contacts should also be advised to not travel internationally for 14 days after the last close contact with a confirmed case of 2019-nCoV, and any travel within Australia during this period should be subject to discussion with the public health unit.

Close contacts should be excluded from schools and sensitive occupations or settings such as health care, aged care, or child care during the 14 days after last unprotected contact with a case.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should not undertake work in a healthcare setting for 14 days following the last possible contact with the case. Home quarantine is not routinely recommended during this period if these individuals remain asymptomatic, but some restrictions may be recommended based on a risk assessment of the particular circumstances.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognized that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed 2019-nCoV cases.

CDNA will continue to monitor the emerging evidence around 2019-nCoV transmission risks in healthcare settings and revise these recommendations as needed.

Management of symptomatic contacts

If fever, respiratory symptoms or other symptoms consistent with 2019-nCoV infection develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected 2019-nCoV cases, with urgent testing for 2019-nCoV infection undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for 2019-nCoV infection can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for 2019-nCoV by PCR will still need to be monitored for 14 days after their last contact with a confirmed 2019-nCoV case and may require re-testing.

Appendix A 2019-nCoV Laboratory testing information

Laboratory testing for 2019-nCoV is likely to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a reference laboratory with capacity to test for 2019-nCov. As co-infection is possible, initial testing protocols should include testing for 2019-nCoV in patients with epidemiological risk, even where another infection is shown to be present. As more information accumulates regarding the risk of dual respiratory viral infections this may be reviewed.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
    - oropharyngeal: swab the tonsilar beds, avoiding the tongue
    - place swabs back into the accompanying transport media

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

Given that for SARS-CoV and MERS-CoV there is evidence that lower respiratory tract specimens contain the highest viral loads, it is therefore advised that lower respiratory tract specimens should be collected where possible for 2019-nCoV testing. Repeat testing (especially of lower respiratory tract specimens) in compatible cases should be performed if initial results are negative and there is a high index of clinical suspicion.

Serology

Where possible, serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with a convalescent serum collected 3 or more weeks after acute sample collection. If no acute sample was collected, a single serum sample collected 14 or more days after symptom onset may be tested.

Handling of specimens in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-viral pathology testing.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is done for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for processes potentially generating aerosols. Attempted viral culture, which would require higher levels of biocontainment would not routinely be attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with 2019-nCoV testing capacity requesting '2019-nCoV/Wuhan Coronavirus' testing.

As stated above, clinician liaison with jurisdictional public health officers is essential to coordinate referral & testing.

As above, standard protocols should be used for sample packaging and transport as diagnostic samples for testing.

2019-nCoV specific testing

NAT using reverse-transcriptase polymerase chain reaction (RT-PCR) is the method of choice for detection of 2019-nCoV. Diagnostic capability for 2019-nCoV is expected to evolve rapidly, hence will be described here only in broad terms. Protocols will be available from the WHO in January 2020, and include PCR followed by specific probe detection of amplicons. The intial PCR detects 2019-nCoV and SARS-CoV, but not commonly circulating coronaviruses usually detected by commercial assays (eg NL63, 229 strains).

Several Australasian Public Health Laboratory Network (PHLN) reference laboratories currently offer PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these have been mapped against the promulgated nucleic acid sequence of the 2019-nCoV, and are expected to detect it on that basis. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach.

Specific PCR primer sets to detect the 2019-nCoV are becoming available, however the majority, including those available through WHO will also detect other zoonotic coronaviruses such as SARS coronavirus.

The 2019-nCoV is yet to be internationally available for use as a test positive control. Synthetic positive control material in the form of nucleic acid templates is becoming available through WHO/ European Viral Archive (EVAg). SARS-CoV may be used as an interim positive control for testing by PHLN member laboratories as an interim measure.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities.

No Quality Assurance Program (QAP) is currently available internationally specific to the 2019-nCoV, although QAPs are available in Australia for respiratory viruses including non-2019-nCoV coronaviruses. The RCPAQAP with Commonwealth support will introduce a 2019-nCoV specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during 2020.

Novel Coronavirus 2019 (2019-nCoV)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for the novel coronavirus (2019-nCoV). It is the first national guidance issued for 2019-nCoV and will be further developed into CDNA National Guidelines for Public Health Units 2019-nCoV (2019-nCoV SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

1. Case definition

Suspect case

As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the epidemiological or clinical criteria below.

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

OR

- Close contact (see Contact definition below) in 14 days before illness onset with a confirmed or suspected case of 2019-nCoV.

Clinical criteria

- Acute respiratory infection (sudden onset of respiratory infection with at least one of: shortness of breath, cough or sore throat) with or without fever or history of fever.

Confirmed case

A person who tests positive to a specific 2019-nCoV PCR test (when available) or has the virus identified by electron microscopy or viral culture, at a reference laboratory.

The case definition may have been updated since the publication of this guideline. Please check the case definitions webpage on the Australian Department of Health's website (www.health.gov.au/internet/main/publishing.nsf/Content/cdna-casedefinitions.htm) for the latest version.

2. Laboratory testing

Patients to be considered for 2019-nCoV testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide 2019-nCoV testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

Transmission-based contact and airborne precautions must be used **when collecting respiratory specimens.** These include:

- Contact precautions, including close attention to hand hygiene.
- Airborne transmission precautions, including routine use of a P2/N95 mask/respirator, disposable gown, gloves, and eye protection.
- Collection in a single room with the door closed, or if in a hospital in a negative pressure room where available.
- If transfer of the confirmed case outside the negative pressure room is necessary, asking the patient to wear a “surgical” face mask while they are being transferred and to follow respiratory hygiene and cough etiquette.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for 2019-nCoV is not yet available.

See Appendix A for additional 2019-nCoV laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the 2019-nCoV public health unit checklist and the 2019-nCoV Investigation Form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide 2019-nCoV factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of 2019-nCoV, the requirements of isolation, contact details of the PHU and the infection control practices that can prevent the transmission of 2019-nCoV.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected, and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for 2019-nCoV. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have 2019-nCoV infection, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited person-to-person transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

Infection control measures should be those applicable to control the transmission of pathogens that can be spread by the airborne route. These measures are detailed in the Interim infection prevention and control advice for acute care hospitals relating to suspected Middle Eastern respiratory syndrome coronavirus (MERs-CoV) infections and can be applied to circumstances with suspected cases of 2019-nCoV.

In summary, transmission-based precautions for suspected and confirmed cases should include:

- Placement of cases in a negative pressure room with an ensuite bathroom, if available, or in a single room from which the air does not circulate to other areas.
- Airborne transmission precautions, including routine use of a P2 respirator/N95 mask where available otherwise a surgical mask is sufficient for routine care, long sleeved disposable gown, gloves, and eye protection when entering a patient care area.
- Contact precautions, including close attention to hand hygiene.

- If transfer of the confirmed case outside the negative pressure room is necessary, asking the patient to wear a “surgical” face mask while they are being transferred and to follow respiratory hygiene and cough etiquette.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of 2019-nCoV is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

According to current evidence there has been a single reported episode of transmission of 2019-nCoV prior to onset of symptoms. As this is an isolated episode it is still considered likely that cases become infectious from onset of symptoms. In recognition of the evolving situation and potential for poor recall of symptom onset by cases, for the purpose defining close contacts (see 6. Contact management) a 24 hour window before onset of symptoms has been applied as a highly precautionary approach.

6. Contact management

As there remain gaps in the understanding of infectivity of 2019-nCoV cases and transmission modes, the definition of contacts and their public health management is based on available information on 2019-nCoV together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding 2019-nCoV infection in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed 2019-nCoV case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of 2019-nCoV. If a crew member is the 2019-nCoV case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed 2019-nCoV case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with 2019-nCoV infection they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected 2019-nCoV case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for 2019-nCoV infection is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of 2019-nCoV and provided with a 2019-nCoV Factsheet. They should be advised to self-isolate if they develop symptoms, and to immediately notify their public health unit and, if appropriate, their facility infection control unit (i.e. for healthcare workers).

Isolation and restriction

Close contacts

Asymptomatic close contacts should be advised to self-isolate at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed 2019-nCoV case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed 2019-nCoV case.

Close contacts should be advised to immediately telephone the public health unit to arrange medical attention if they develop symptoms such as fever, respiratory symptoms (including coughing and shortness of breath), headache, muscle pain or diarrhoea.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left of transited through China in the last 14 days **who are unwell** with respiratory symptoms, with or without fever, or other symptoms consistent with 2019-nCoV should be isolated and managed as per the current recommendations for suspected case.

Well returned travellers who have left or transited through mainland China (excluding Hubei) on or after 1 February 2020, should self-isolate at home for 14 days after leaving mainland China.

Well returned travellers who have left Hubei province (including Wuhan) on or after 29 January 2020, should self-isolate at home for 14 days after leaving Hubei.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-isolate at home for 14 days following the last contact with the case.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed 2019-nCoV cases.

CDNA will continue to monitor the emerging evidence around 2019-nCoV transmission risks in healthcare settings and revise these recommendations as needed.

Management of symptomatic contacts

If respiratory symptoms, with or without fever, or other symptoms consistent with 2019-nCoV infection develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected 2019-nCoV cases, with urgent testing for 2019-nCoV infection undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for 2019-nCoV infection can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for 2019-nCoV by PCR will still need to be monitored for 14 days after their last contact with a confirmed 2019-nCoV case and may require re-testing.

Appendix A 2019-nCoV Laboratory testing information

Laboratory testing for 2019-nCoV is likely to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a reference laboratory with capacity to test for 2019-nCov. As co-infection is possible, initial testing protocols should include testing for 2019-nCoV in patients with epidemiological risk, even where another infection is shown to be present. As more information accumulates regarding the risk of dual respiratory viral infections this may be reviewed.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred
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    - oropharyngeal: swab the tonsilar beds, avoiding the tongue
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2. Nasal wash/aspirates
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1. Sputum
    - patient should rinse his/her mouth with water before collection
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2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid
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Serology

Where possible, serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with a convalescent serum collected 3 or more weeks after acute sample collection. If no acute sample was collected, a single serum sample collected 14 or more days after symptom onset may be tested.

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The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with 2019-nCoV testing capacity requesting '2019-nCoV Coronavirus' testing.

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CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
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The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the

Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

1. Case definition

Suspect case

As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the epidemiological or clinical criteria below.

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close contact (see Contact definition below) in 14 days before illness onset with a confirmed case of 2019-nCoV.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Confirmed case

A person who tests positive to a specific 2019-nCoV PCR test (when available) or has the virus identified by electron microscopy or viral culture, at a reference laboratory.

The case definition may have been updated since the publication of this guideline. Please check the case definitions webpage on the Australian Department of Health's website (www.health.gov.au/internet/main/publishing.nsf/Content/cdna-casedefinitions.htm) for the latest version.

2. Laboratory testing

Patients to be considered for 2019-nCoV testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide 2019-nCoV testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

Transmission-based contact and airborne precautions must be used **when collecting respiratory specimens.** These include:

- Contact precautions, including close attention to hand hygiene.
- Airborne transmission precautions, including routine use of a P2/N95 mask/respirator, disposable gown, gloves, and eye protection.
- Collection in a single room with the door closed, or if in a hospital in a negative pressure room where available.
- If transfer of the confirmed case outside the negative pressure room is necessary, asking the patient to wear a “surgical” face mask while they are being transferred and to follow respiratory hygiene and cough etiquette.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for 2019-nCoV is not yet available.

See Appendix A for additional 2019-nCoV laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the 2019-nCoV public health unit checklist and the 2019-nCoV Investigation Form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide 2019-nCoV factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of 2019-nCoV, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of 2019-nCoV.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected, and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for 2019-nCoV. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have 2019-nCoV infection, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited person-to-person transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

Infection control measures should be those applicable to control the transmission of pathogens that can be spread by the airborne route. These measures are detailed in the Interim infection prevention and control advice for acute care hospitals relating to suspected Middle Eastern respiratory syndrome coronavirus (MERs-CoV) infections and can be applied to circumstances with suspected cases of 2019-nCoV.

In summary, transmission-based precautions for suspected and confirmed cases should include:

- Placement of cases in a negative pressure room with an ensuite bathroom, if available, or in a single room from which the air does not circulate to other areas.
- Airborne transmission precautions, including routine use of a P2 respirator/N95 mask where available otherwise a surgical mask is sufficient for routine care, long sleeved disposable gown, gloves, and eye protection when entering a patient care area.
- Contact precautions, including close attention to hand hygiene.

- If transfer of the confirmed case outside the negative pressure room is necessary, asking the patient to wear a “surgical” face mask while they are being transferred and to follow respiratory hygiene and cough etiquette.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of 2019-nCoV is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

According to current evidence there has been a single reported episode of transmission of 2019-nCoV prior to onset of symptoms. As this is an isolated episode it is still considered likely that cases become infectious from onset of symptoms. In recognition of the evolving situation and potential for poor recall of symptom onset by cases, for the purpose defining close contacts (see 6. Contact management) a 24 hour window before onset of symptoms has been applied as a highly precautionary approach.

6. Contact management

As there remain gaps in the understanding of infectivity of 2019-nCoV cases and transmission modes, the definition of contacts and their public health management is based on available information on 2019-nCoV together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding 2019-nCoV infection in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed 2019-nCoV case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of 2019-nCoV. If a crew member is the 2019-nCoV case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed 2019-nCoV case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with 2019-nCoV infection they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected 2019-nCoV case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for 2019-nCoV infection is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of 2019-nCoV and provided with a 2019-nCoV Factsheet. They should be advised to self-quarantine.

Isolation and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed 2019-nCoV case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed 2019-nCoV case.

Close contacts should be advised to immediately telephone the public health unit to arrange medical attention if they develop symptoms such as fever, respiratory symptoms (including coughing and shortness of breath), headache, muscle pain or diarrhoea.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts

should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left of transited through China in the last 14 days **who are unwell** with respiratory symptoms, with or without fever, or other symptoms consistent with 2019-nCoV should be isolated and managed as per the current recommendations for suspected case.

Well returned travellers who have left or transited through mainland China (excluding Hubei) on or after 1 February 2020, should self-quarantine at home for 14 days after leaving mainland China.

Well returned travellers who have left Hubei province (including Wuhan) on or after 29 January 2020, should self-quarantine at home for 14 days after leaving Hubei.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed 2019-nCoV cases.

CDNA will continue to monitor the emerging evidence around 2019-nCoV transmission risks in healthcare settings and revise these recommendations as needed.

Management of symptomatic contacts

If respiratory symptoms, with or without fever, or other symptoms consistent with 2019-nCoV infection develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected 2019-nCoV cases, with urgent testing for 2019-nCoV infection undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for 2019-nCoV infection can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for 2019-nCoV by PCR will still need to be monitored for 14 days after their last contact with a confirmed 2019-nCoV case and may require re-testing.

Appendix A 2019-nCoV Laboratory testing information

Laboratory testing for 2019-nCoV is likely to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a reference laboratory with capacity to test for 2019-nCov. As co-infection is possible, initial testing protocols should include testing for 2019-nCoV in patients with epidemiological risk, even where another infection is shown to be present. As more information accumulates regarding the risk of dual respiratory viral infections this may be reviewed.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred
    - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
    - oropharyngeal: swab the tonsilar beds, avoiding the tongue
    - place swabs back into the accompanying transport media
2. Nasal wash/aspirates
    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples

1. Sputum
    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container
2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid
    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

Given that for SARS-CoV and MERS-CoV there is evidence that lower respiratory tract specimens contain the highest viral loads, it is therefore advised that lower respiratory tract specimens should be collected where possible for 2019-nCoV testing. Repeat testing (especially of lower respiratory tract specimens) in compatible cases should be performed if initial results are negative and there is a high index of clinical suspicion.

Serology

Where possible, serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with a convalescent serum collected 3 or more weeks after acute sample collection. If no acute sample was collected, a single serum sample collected 14 or more days after symptom onset may be tested.

Handling of specimens in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-viral pathology testing.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is done for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for processes potentially generating aerosols. Attempted viral culture, which would require higher levels of biocontainment would not routinely be attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with 2019-nCoV testing capacity requesting '2019-nCoV Coronavirus' testing.

As stated above, clinician liaison with jurisdictional public health officers is essential to coordinate referral & testing.

As above, standard protocols should be used for sample packaging and transport as diagnostic samples for testing.

2019-nCoV specific testing

NAT using reverse-transcriptase polymerase chain reaction (RT-PCR) is the method of choice for detection of 2019-nCoV. Diagnostic capability for 2019-nCoV is expected to evolve rapidly, hence will be described here only in broad terms. Protocols will be available from the WHO in January 2020, and include PCR followed by specific probe detection of amplicons. The initial PCR detects 2019-nCoV and SARS-CoV, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229 strains).

Several Australasian Public Health Laboratory Network (PHLN) reference laboratories currently offer PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these have been mapped against the promulgated nucleic acid sequence of the 2019-nCoV, and are expected to detect it on that basis. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach.

Specific PCR primer sets to detect the 2019-nCoV are becoming available, however the majority, including those available through WHO will also detect other zoonotic coronaviruses such as SARS coronavirus.

The 2019-nCoV is yet to be internationally available for use as a test positive control. Synthetic positive control material in the form of nucleic acid templates is becoming available through WHO/ European Viral Archive (EVAg). SARS-CoV may be used as an interim positive control for testing by PHLN member laboratories as an interim measure.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities.

No Quality Assurance Program (QAP) is currently available internationally specific to the 2019-nCoV, although QAPs are available in Australia for respiratory viruses including non-2019-nCoV coronaviruses. The RCPAQAP with Commonwealth support will introduce a 2019-nCoV specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during 2020.

Novel Coronavirus 2019 (2019-nCoV)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for the novel coronavirus (2019-nCoV). It is the first national guidance issued for 2019-nCoV and will be further developed into CDNA National Guidelines for Public Health Units 2019-nCoV (2019-nCoV SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

1. Case definition

Suspect case

As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the epidemiological or clinical criteria below.

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of 2019-nCoV.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Confirmed case

A person who tests positive to a specific 2019-nCoV PCR test (when available) or has the virus identified by electron microscopy or viral culture, at a reference laboratory.

The case definition may have been updated since the publication of this guideline. Please check the case definitions webpage on the Australian Department of Health's website (www.health.gov.au/internet/main/publishing.nsf/Content/cdna-casedefinitions.htm) for the latest version.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of 2019-nCoV presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts they will be reflected in the above definitions in future versions of this document. Same for epidemiological criteria if new areas of sustained human-to-human transmission emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for 2019-nCoV testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide 2019-nCoV testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for 2019-nCoV is not yet available. Collection of serum for storage by the 2019-nCoV testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional 2019-nCoV laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the 2019-nCoV public health unit checklist and the 2019-nCoV Investigation Form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide 2019-nCoV factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of 2019-nCoV, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of 2019-nCoV.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for 2019-nCoV. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have 2019-nCoV infection, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited person-to-person transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

Interim recommendations for the use of PPE during clinical care of people with possible 2019-nCoV infection are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed 2019-nCoV infection.
- **Contact and airborne precautions** are recommended when performing **aerosol generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- On presentation of the patient to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room (a negative pressure room or a room from which the air does not circulate to other areas are preferable, if available).
- If a patient with confirmed 2019-nCoV infection needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Aerosol-generating procedures

The potential for airborne spread of 2019-nCoV is still unknown, but appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for 2019-nCoV.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of 2019-nCoV is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

According to current evidence there has been a single reported episode of transmission of 2019-nCoV prior to onset of symptoms. As this is an isolated episode it is still considered likely that cases become infectious from onset of symptoms. In recognition of the evolving situation and potential for poor recall of symptom onset by cases, for the purpose defining close contacts (see 6. Contact management) a 24 hour window before onset of symptoms has been applied as a highly precautionary approach.

6. Contact management

As there remain gaps in the understanding of infectivity of 2019-nCoV cases and transmission modes, the definition of contacts and their public health management is based on available information on 2019-nCoV together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding 2019-nCoV infection in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed 2019-nCoV case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of 2019-nCoV. If a crew member is the 2019-nCoV case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed 2019-nCoV case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with 2019-nCoV infection they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected 2019-nCoV case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for 2019-nCoV infection is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of 2019-nCoV and provided with a 2019-nCoV Factsheet. They should be advised to self-quarantine.

Isolation and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed 2019-nCoV case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed 2019-nCoV case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts

should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with 2019-nCoV should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China (excluding Hubei) on or after 1 February 2020, should self-quarantine at home for 14 days after leaving mainland China.

Well returned travellers who have left Hubei province (including Wuhan) on or after 29 January 2020, should self-quarantine at home for 14 days after leaving Hubei.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed 2019-nCoV cases.

CDNA will continue to monitor the emerging evidence around 2019-nCoV transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of 2019-nCoV.** If the patient has **symptoms consistent with nCoV** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If respiratory symptoms, with or without fever, or other symptoms consistent with 2019-nCoV infection develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for

suspected 2019-nCoV cases, with urgent testing for 2019-nCoV infection undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for 2019-nCoV infection can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for 2019-nCoV by PCR will still need to be monitored for 14 days after their last contact with a confirmed 2019-nCoV case and may require re-testing.

Appendix A 2019-nCoV Laboratory testing information

Laboratory testing for 2019-nCoV continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for 2019-nCov. As co-infection is possible, initial testing protocols should include testing for 2019-nCoV in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
    - oropharyngeal: swab the tonsilar beds, avoiding the tongue
    - place swabs back into the accompanying transport media
2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precaations)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for 2019-nCoV testing where possible. Initial experience in testing for 2019-nCoV seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in

parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and hematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with 2019-nCoV testing capacity requesting 2019-nCoV testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

2019-nCoV specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of 2019-nCoV. Specific diagnostic test approaches for 2019-nCoV will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the 2019-nCoV are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the 2019-nCoV target, but not commonly circulating coronaviruses usually detected by commercial assays (eg NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of 2019-nCoV early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL 2019-nCoV has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific 2019-nCoV international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for 2019-nCoV, although QAPs are available in Australia for respiratory viruses including coronaviruses other than 2019-nCoV. The RCPAQAP with Commonwealth support will introduce a 2019-nCoV specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Novel Coronavirus 2019 (2019-nCoV)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for the novel coronavirus (2019-nCoV). It is the first national guidance issued for 2019-nCoV and will be further developed into CDNA National Guidelines for Public Health Units 2019-nCoV (2019-nCoV SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

1. Case definition

Suspect case

As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the epidemiological or clinical criteria below.

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of 2019-nCoV.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Confirmed case

A person who tests positive to a specific 2019-nCoV PCR test (when available) or has the virus identified by electron microscopy or viral culture, at a reference laboratory.

The case definition may have been updated since the publication of this guideline. Please check the case definitions webpage on the Australian Department of Health's website (www.health.gov.au/internet/main/publishing.nsf/Content/cdna-casedefinitions.htm) for the latest version.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of 2019-nCoV presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same applies for epidemiological criteria if new areas of sustained human-to-human transmission emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for 2019-nCoV testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide 2019-nCoV testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for 2019-nCoV is not yet available. Collection of serum for storage by the 2019-nCoV testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional 2019-nCoV laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the 2019-nCoV public health unit checklist and the 2019-nCoV Investigation Form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide 2019-nCoV factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of 2019-nCoV, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of 2019-nCoV.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for 2019-nCoV. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have 2019-nCoV infection, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited human-to-human transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

Interim recommendations for the use of PPE during clinical care of people with possible 2019-nCoV infection are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed 2019-nCoV infection.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- On presentation of the patient to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed 2019-nCoV infection needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of the 2019-nCoV infection have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for 2019-nCoV. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care)

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with 2019-nCoV infection.

Aerosol-generating procedures

The potential for airborne spread of 2019-nCoV is still unknown, but appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for 2019-nCoV.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of 2019-nCoV is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

According to current evidence there has been a single reported episode of transmission of 2019-nCoV prior to onset of symptoms. As this is an isolated episode it is still considered likely that cases become infectious from onset of symptoms. In recognition of the evolving situation and potential for poor recall of symptom onset by cases, for the purpose defining close contacts (see 6. Contact management) a 24 hour window before onset of symptoms has been applied as a highly precautionary approach.

6. Contact management

As there remain gaps in the understanding of infectivity of 2019-nCoV cases and transmission modes, the definition of contacts and their public health management is based on available information on 2019-nCoV together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of "close contacts" and "casual contacts" following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding 2019-nCoV infection in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or
- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.

- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed 2019-nCoV case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of 2019-nCoV. If a crew member is the 2019-nCoV case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed 2019-nCoV case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with 2019-nCoV infection they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected 2019-nCoV case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for 2019-nCoV infection is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of 2019-nCoV and provided with a 2019-nCoV Factsheet. They should be advised to self-quarantine.

Isolation and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed 2019-nCoV case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed 2019-nCoV case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with 2019-nCoV should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China (excluding Hubei) on or after 1 February 2020, should self-quarantine at home for 14 days after leaving mainland China.

Well returned travellers who have left Hubei province (including Wuhan) on or after 29 January 2020, should self-quarantine at home for 14 days after leaving Hubei.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed 2019-nCoV cases.

CDNA will continue to monitor the emerging evidence around 2019-nCoV transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of 2019-nCoV.** If the patient has **symptoms consistent with 2019-nCoV** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If respiratory symptoms, with or without fever, or other symptoms consistent with 2019-nCoV infection develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected 2019-nCoV cases, with urgent testing for 2019-nCoV infection undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for 2019-nCoV infection can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for 2019-nCoV by PCR will still need to be monitored for 14 days after their last contact with a confirmed 2019-nCoV case and may require re-testing.

Appendix A 2019-nCoV Laboratory testing information

Laboratory testing for 2019-nCoV continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for 2019-nCov. As co-infection is possible, initial testing protocols should include testing for 2019-nCoV in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
    - oropharyngeal: swab the tonsilar beds, avoiding the tongue
    - place swabs back into the accompanying transport media
2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for 2019-nCoV testing where possible. Initial experience in testing for 2019-nCoV seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with 2019-nCoV testing capacity requesting 2019-nCoV testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

2019-nCoV specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of 2019-nCoV. Specific diagnostic test approaches for 2019-nCoV will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the 2019-nCoV are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the 2019-nCoV target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of 2019-nCoV early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL 2019-nCoV has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific 2019-nCoV international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for 2019-nCoV, although QAPs are available in Australia for respiratory viruses including coronaviruses other than 2019-nCoV. The RCPAQAP with Commonwealth support will introduce a 2019-nCoV specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

COVID-19
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Suspect case

As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the epidemiological or clinical criteria below.

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Confirmed case

A person who tests positive to a specific SARS-CoV-2 PCR test (when available) or has the virus identified by electron microscopy or viral culture, at a reference laboratory.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same applies for epidemiological criteria if new areas of sustained human-to-human transmission emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for SARS-CoV-2 testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited human-to-human transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- On presentation of the patient to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care)

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

According to current evidence there has been a single reported episode of transmission of COVID-19 prior to onset of symptoms. As this is an isolated episode it is still considered likely that cases become infectious from onset of symptoms. In recognition of the evolving situation and potential for poor recall of symptom onset by cases, for the purpose defining close contacts (see Contact management) a 24 hour window before onset of symptoms has been applied as a highly precautionary approach.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of "close contacts" and "casual contacts" following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or
- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.

- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Isolation and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China (excluding Hubei) on or after 1 February 2020, should self-quarantine at home for 14 days after leaving mainland China.

Well returned travellers who have left Hubei province (including Wuhan) should self-quarantine at home for 14 days after leaving Hubei.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
    - oropharyngeal: swab the tonsilar beds, avoiding the tongue
    - place swabs back into the accompanying transport media
2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than SARS-CoV-2. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

COVID-19
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a specific SARS-CoV-2 PCR test or has the virus identified by electron microscopy or viral culture, at a reference laboratory.

Suspect case

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Person under investigation

It is recommended that clinicians should consider testing people with a clinically compatible illness who travelled to any of the following countries in the 14 days before onset of symptoms:

- Hong Kong
- Indonesia
- Japan
- Singapore
- Thailand

This list* is based on the volume of travel between those countries, Australia and China, and/or the current epidemiology of COVID-19; however, the risk of COVID-19 in these countries is currently thought to be low. Clinical and public health judgement should be applied. The recommendation does not apply to passengers who have only been in transit through an airport in these countries.

Note: if a clinician determines that a **person under investigation** should be tested then that person must be managed as a **suspect case**.

*This list is in alphabetical order.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for SARS-CoV-2 testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**

- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited human-to-human transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- On presentation of the patient to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.

- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person’s treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

According to current evidence there has been a single reported episode of transmission of COVID-19 prior to onset of symptoms. As this is an isolated episode it is still considered likely that cases become infectious from onset of symptoms. In recognition of the evolving situation and potential for poor recall of symptom onset by cases, for the purpose defining close contacts (see Contact management) a 24 hour window before onset of symptoms has been applied as a highly precautionary approach.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Isolation and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China (excluding Hubei) on or after 1 February 2020, should self-quarantine at home for 14 days after leaving mainland China.

Well returned travellers who have left Hubei province (including Wuhan) should self-quarantine at home for 14 days after leaving Hubei.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
    - oropharyngeal: swab the tonsilar beds, avoiding the tongue
    - place swabs back into the accompanying transport media

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than SARS-CoV-2. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

COVID-19
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a specific SARS-CoV-2 PCR test or has the virus identified by electron microscopy or viral culture, at a reference laboratory.

Suspect case

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Person under investigation

It is recommended that clinicians should consider testing people with a clinically compatible illness who travelled to any of the following countries in the 14 days before onset of symptoms:

- Hong Kong
- Indonesia
- Japan
- Singapore
- Thailand

This list* is based on the volume of travel between those countries, Australia and China, and/or the current epidemiology of COVID-19; however, the risk of COVID-19 in these countries is currently thought to be low. Clinical and public health judgement should be applied. The recommendation does not apply to passengers who have only been in transit through an airport in these countries.

Note: if a clinician determines that a **person under investigation** should be tested then that person must be managed as a **suspect case**.

*This list is in alphabetical order.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for SARS-CoV-2 testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**

- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited human-to-human transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- On presentation of the patient to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.

- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person’s treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

According to current evidence there has been a single reported episode of transmission of COVID-19 prior to onset of symptoms. As this is an isolated episode it is still considered likely that cases become infectious from onset of symptoms. In recognition of the evolving situation and potential for poor recall of symptom onset by cases, for the purpose defining close contacts (see Contact management) a 24 hour window before onset of symptoms has been applied as a highly precautionary approach.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

*Close contact definition**

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

*On 17 February 2020, CDNA agreed that due to the ongoing transmission of COVID-19 on the Diamond Princess, all passengers and crew onboard the Diamond Princess cruise (which departed Yokohama on 20 January 2020 returning on 04 February 2020) are deemed close contacts and to be managed as such for up to 14 days from their departure from the ship.

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office, or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Isolation and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China (excluding Hubei) on or after 1 February 2020, should self-quarantine at home for 14 days after leaving mainland China.

Well returned travellers who have left Hubei province (including Wuhan) should self-quarantine at home for 14 days after leaving Hubei.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

   - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
   - oropharyngeal: swab the tonsilar beds, avoiding the tongue
   - place swabs back into the accompanying transport media

2. Nasal wash/aspirates

   - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

   - patient should rinse his/her mouth with water before collection
   - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

   - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than SARS-CoV-2. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
    - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
    - long-sleeved gown
    - P2/N95 respirator (mask) – should be fit-checked with each use
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
    - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Person under investigation

It is recommended that clinicians should consider testing people with a clinically compatible illness who travelled to any of the following countries in the 14 days before onset of symptoms:

- Hong Kong
- Indonesia
- Japan
- Singapore
- Thailand

This list* is based on the volume of travel between those countries, Australia and China, and/or the current epidemiology of COVID-19; however, the risk of COVID-19 in these countries is currently thought to be low. Clinical and public health judgement should be applied. The recommendation does not apply to passengers who have only been in transit through an airport in these countries.

Note: if a clinician determines that a **person under investigation** should be tested then that person must be managed as a **suspect case** until COVID-19 is confirmed or excluded as the cause of illness.

*This list is in alphabetical order.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for SARS-CoV-2 testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**

- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited human-to-human transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.

- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person’s treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1, 2). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

*Close contact definition**

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through mainland China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China should self-quarantine at home for 14 days after leaving mainland China.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

8. References

1. WHO. Novel coronavirus (2019-nCoV) situational report-26 15 February 2020 Geneva: WHO; 2020 [cited 16 Feb 2020]. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200215-sitrep-26-covid-19.pdf?sfvrsn=a4cc6787_2

2. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

   - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
   - oropharyngeal: swab the tonsilar beds, avoiding the tongue
   - place swabs back into the accompanying transport media

2. Nasal wash/aspirates

   - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

   - patient should rinse his/her mouth with water before collection
   - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

   - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than SARS-CoV-2. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
    - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
    - long-sleeved gown
    - P2/N95 respirator (mask) – should be fit-checked with each use
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
    - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition

1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

*This list is in alphabetical order.

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Person under investigation

It is recommended that clinicians should consider testing people with a clinically compatible illness who travelled to any of the following countries in the 14 days before onset of symptoms:

- Hong Kong
- Indonesia
- Iran
- Japan
- Singapore
- South Korea
- Thailand

This list* is based on the volume of travel between those countries, Australia and China, and/or the current epidemiology of COVID-19; however, the risk of COVID-19 in these countries is currently thought to be low. Clinical and public health judgement should be applied. The recommendation does not apply to passengers who have only been in transit through an airport in these countries.

Note: if a clinician determines that a **person under investigation** should be tested then that person must be managed as a **suspect case** until COVID-19 is confirmed or excluded as the cause of illness.

*This list is in alphabetical order.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for SARS-CoV-2 testing are described under the suspected case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**

- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited human-to-human transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.

- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person’s treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1, 2). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

*Close contact definition**

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through mainland China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China should self-quarantine at home for 14 days after leaving mainland China.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

8. References

1. WHO. Novel coronavirus (2019-nCoV) situational report-26 15 February 2020 Geneva: WHO; 2020 [cited 16 Feb 2020]. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200215-sitrep-26-covid-19.pdf?sfvrsn=a4cc6787_2

2. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

   - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
   - oropharyngeal: swab the tonsilar beds, avoiding the tongue
   - place swabs back into the accompanying transport media

2. Nasal wash/aspirates

   - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

   - patient should rinse his/her mouth with water before collection
   - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

   - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than SARS-CoV-2. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.

1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Person under investigation

It is recommended that clinicians should consider testing people with a clinically compatible illness who travelled to any of the following countries in the 14 days before onset of symptoms:

- Hong Kong
- Indonesia
- Iran
- Italy
- Japan
- Singapore
- South Korea
- Thailand

This list* is based on the volume of travel between those countries, Australia and China, and/or the current epidemiology of COVID-19; however, the risk of COVID-19 in these countries is currently thought to be low. Clinical and public health judgement should be applied. The recommendation does not apply to passengers who have only been in transit through an airport in these countries.

Note: if a clinician determines that a **person under investigation** should be tested then that person must be managed as a **suspect case** until COVID-19 is confirmed or excluded as the cause of illness.

*This list is in alphabetical order.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for SARS-CoV-2 testing are described under the suspect case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**

- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited human-to-human transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.

- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person’s treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

*Close contact definition**

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through mainland China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China should self-quarantine at home for 14 days after leaving mainland China.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

   - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
   - oropharyngeal: swab the tonsilar beds, avoiding the tongue
   - place swabs back into the accompanying transport media

2. Nasal wash/aspirates

   - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

   - patient should rinse his/her mouth with water before collection
   - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

   - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than SARS-CoV-2. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
    - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
    - long-sleeved gown
    - P2/N95 respirator (mask) – should be fit-checked with each use
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
    - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person under investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person under investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.

1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Person under investigation

It is recommended that clinicians should consider testing people with a clinically compatible illness who travelled to any of the following countries in the 14 days before onset of symptoms:

- Cambodia
- Hong Kong
- Indonesia
- Iran
- Italy
- Japan
- Singapore
- South Korea
- Thailand

This list* is based on the volume of travel between those countries, Australia and China, and/or the current epidemiology of COVID-19; however, the risk of COVID-19 in these countries is currently thought to be low. Clinical and public health judgement should be applied. The recommendation does not apply to passengers who have only been in transit through an airport in these countries.

Note: if a clinician determines that a **person under investigation** should be tested then that person must be managed as a **suspect case** until COVID-19 is confirmed or excluded as the cause of illness.

*This list is in alphabetical order.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients to be considered for SARS-CoV-2 testing are described under the suspect case definition (above). Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing, appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**

- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

Given the severity of reported infections, the evidence of limited human-to-human transmission, and gaps in knowledge of transmission pathways, the recommendations on isolation and PPE for management of suspected and confirmed cases take a deliberately cautious approach.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy.

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.

- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person’s treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

*Close contact definition**

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through mainland China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China should self-quarantine at home for 14 days after leaving mainland China.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/or oropharyngeal swab, Dacron or Rayon, flocked preferred

   - nasopharyngeal: insert a swab into each nostril parallel to the palate, leave the swab in place for a few seconds to absorb secretions
   - oropharyngeal: swab the tonsilar beds, avoiding the tongue
   - place swabs back into the accompanying transport media

2. Nasal wash/aspirates

   - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

   - patient should rinse his/her mouth with water before collection
   - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

   - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Virology

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Attempted viral culture, which would require higher levels of biocontainment would not be routinely attempted.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect the SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australasian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than SARS-CoV-2. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.

1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health (‘the Commonwealth’), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) mainland China in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

Person under investigation

It is recommended that clinicians should consider testing people with a clinically compatible illness who travelled to any of the following countries in the 14 days before onset of symptoms:

- Cambodia
- Hong Kong
- Indonesia
- Iran
- Italy
- Japan
- Singapore
- South Korea
- Thailand

This list* is based on the volume of travel between those countries, Australia and China, and/or the current epidemiology of COVID-19; however, the risk of COVID-19 in these countries is currently thought to be low. Clinical and public health judgement should be applied. The recommendation does not apply to passengers who have only been in transit through an airport in these countries.

Note: if a clinician determines that a **person under investigation** should be tested then that person must be managed as a **suspect case** until COVID-19 is confirmed or excluded as the cause of illness.

*This list is in alphabetical order.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**

- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports less stringent requirements in most circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information)**.**

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.

- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person’s treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

*Close contact definition**

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers who have left or transited through mainland China

Returned travellers who have left or transited through mainland China in the last 14 days **who are unwell** with fever or with respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Well returned travellers who have left or transited through mainland China should self-quarantine at home for 14 days after leaving mainland China.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Healthcare worker close contacts

Healthcare worker close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/ oropharyngeal swab, Dacron or Rayon, flocked preferred

   - nasopharyngeal: insert a flexible nasopharyngeal swab into one nostril and gently insert it along the floor of the nasal cavity parallel to the palate until resistance is encountered, rotate gently for 10-15 seconds, then withdraw and repeat the process in the other nostril with the same swab to absorb secretions
   - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
   - place swabs back into the accompanying transport media

As a minimum standard recommendation across all jurisdictions, a nasopharyngeal and an oropharyngeal swab should both be collected, and placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

Details of practice above this minimum may vary between jurisdictions, eg pooling both swabs in a single container of transport medium; use of a single swab for collection of both nasopharyngeal and oropharyngeal samples; collection of two nasopharyngeal swabs and one oropharyngeal sample. Liaison with the jurisdiction's PHLN-member laboratory is recommended to obtain clarity on local variations.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then both nasopharyngeal and oropharyngeal samples should be forwarded for SARS-CoV-2 testing. Use of one swab for respiratory virus testing, and the other for SARS-CoV-2 testing is not recommended.

2. Nasal wash/aspirates

   - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

   - patient should rinse his/her mouth with water before collection
   - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

   - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (eg NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than 2019-nCoV. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.

1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practice based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health (‘the Commonwealth’), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) a country considered to pose a risk of transmission* in the 14 days before the onset of illness.

  OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

  OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

*Country transmission risk assessment

This list is based on the risk of the person having been exposed to COVID-19 due to travel to a country with sustained community transmission and/or based on the patterns of travel between those countries and Australia, and/or the other epidemiological evidence. The recommendation does not apply to passengers who have only been in transit through an airport for moderate risk countries.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information)**.**

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
  - given a surgical mask to put on, and
  - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or
- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).

- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.

- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Returned Traveller definition

Returned travellers who, in the last 14 days, have left or transited through a listed country that is considered to pose an increased risk of transmission.

Within any risk category, different recommendations may apply in management. See detail below.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts

should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers

Returned travellers who have travelled in or transited though **mainland China or Iran** should self-quarantine at home for 14 days after leaving the high risk country. Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have travelled in or transited through **the remaining listed higher risk countries or a country considered to pose a moderate risk** of transmission in the last 14 days should self-monitor for symptoms, practice social distancing and immediately isolate themselves if they become unwell. Social distancing includes:

- Avoiding crowds and mass gatherings
- Avoiding small gatherings in enclosed spaces, for e.g., family celebrations.
- Keeping a distance of 1.5 metres between themselves and other people when out and about in public.

Returned travellers who, in the last 14 days, have travelled in or transited through **any of the countries** considered to pose a risk of transmission **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Special risk settings

Healthcare workers (including in residential and aged care facilities)

Healthcare workers includes people who come into contact with patients in a health care setting and people working with residents in residential care facilities.

Healthcare workers who have returned from any higher risk country should be advised not to undertake work in a health care or residential care setting for 14 days since leaving the high risk country. They should otherwise follow advice provided to other well returned travellers as above.

Healthcare workers who are close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare or residential care setting for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/ oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a flexible nasopharyngeal swab into one nostril and gently insert it along the floor of the nasal cavity parallel to the palate until resistance is encountered, rotate gently for 10-15 seconds, then withdraw and repeat the process in the other nostril with the same swab to absorb secretions
    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - place swabs back into the accompanying transport media

As a minimum standard recommendation across all jurisdictions, a nasopharyngeal and an oropharyngeal swab should both be collected, and placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

Details of practice above this minimum may vary between jurisdictions, eg pooling both swabs in a single container of transport medium; use of a single swab for collection of both nasopharyngeal and oropharyngeal samples; collection of two nasopharyngeal swabs and one oropharyngeal sample. Liaison with the jurisdiction's PHLN-member laboratory is recommended to obtain clarity on local variations.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then both nasopharyngeal and oropharyngeal samples should be forwarded for SARS-CoV-2 testing. Use of one swab for respiratory virus testing, and the other for SARS-CoV-2 testing is not recommended.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (eg NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than 2019-nCoV. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.

1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health (‘the Commonwealth’), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

A. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) a country considered to pose a risk of transmission* in the 14 days before the onset of illness.

OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

B. If the patient has severe community-acquired pneumonia (critically ill) and no other cause is identified, with or without recent international travel, they are classified as a suspect case.

C. If the patient has moderate or severe community-acquired pneumonia (hospitalised) and is a healthcare worker, with or without international travel, they are classified as a suspect case.

*Country transmission risk assessment

Higher risk:

Mainland China
Iran
Italy
South Korea

Moderate Risk:

Cambodia
Hong Kong
Indonesia
Japan

Singapore
Thailand

This list is based on the risk of the person having been exposed to COVID-19 due to travel to a country with sustained community transmission and/or based on the patterns of travel between those countries and Australia, and/or the other epidemiological evidence.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practises and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practises that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information)**.**

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:

    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person’s treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Returned Traveller definition

Returned travellers who, in the last 14 days, have left or transited through a listed country that is considered to pose an increased risk of transmission.

Within any risk category, different recommendations may apply in management. See detail below.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country. Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who, in the last 14 days, have travelled in or transited through **the remaining countries considered to pose a risk of transmission** should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Returned travellers who, in the last 14 days, have travelled in or transited through **any of the countries considered to pose a risk of transmission who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases. Table 1 below summarises the recommendations for travellers returning from each at risk country by risk category.

Special risk settings

Healthcare workers (including in residential and aged care facilities)

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers should observe usual infection prevention and control practises in the workplace.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above. Table 1 below summarises the recommendations for healthcare workers returning from each at risk country by risk category.

Table 1: Actions for travellers and healthcare workers returning from countries considered to pose a risk of transmission.

Risk	Country	General actions	Action for Hospital and/or Residential/Aged Care facilities*
Higher risk	Mainland China Iran	Self-quarantine for 14 day	No work for 14 days
Higher risk	Italy South Korea	Self-monitor for 14 days Practise social distancing Isolate if unwell	No work for 14 days
Moderate risk	Cambodia Hong Kong Indonesia Japan Singapore Thailand	Self-monitor for 14 days Practise social distancing Isolate if unwell	Can return to work if well

*People working in hospitals or aged/residential care facilities who have patient contact.

Healthcare workers who are close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare or residential/aged care facility for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/ oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a flexible nasopharyngeal swab into one nostril and gently insert it along the floor of the nasal cavity parallel to the palate until resistance is encountered, rotate gently for 10-15 seconds, then withdraw and repeat the process in the other nostril with the same swab to absorb secretions
    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - place swabs back into the accompanying transport media

As a minimum standard recommendation across all jurisdictions, a nasopharyngeal and an oropharyngeal swab should both be collected, and placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

Details of practise above this minimum may vary between jurisdictions, e.g. pooling both swabs in a single container of transport medium; use of a single swab for collection of both nasopharyngeal and oropharyngeal samples; collection of two nasopharyngeal swabs and one oropharyngeal sample. Liaison with the jurisdiction's PHLN-member laboratory is recommended to obtain clarity on local variations.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then both nasopharyngeal and oropharyngeal samples should be forwarded for SARS-CoV-2 testing. Use of one swab for respiratory virus testing, and the other for SARS-CoV-2 testing is not recommended.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practises and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practises, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (eg NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than 2019-nCoV. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.

1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

A. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) a country considered to pose a risk of transmission* in the 14 days before the onset of illness.

OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

B. If the patient has severe community-acquired pneumonia (critically ill) and no other cause is identified, with or without recent international travel, they are classified as a suspect case.

C. If the patient has moderate or severe community-acquired pneumonia (hospitalised) and is a healthcare worker, with or without international travel, they are classified as a suspect case.

*Country transmission risk assessment

Higher risk:

Mainland China
Iran
Italy
South Korea

Moderate Risk:

Cambodia
Hong Kong
Indonesia

Japan
Singapore
Thailand

This list is based on the risk of the person having been exposed to COVID-19 due to travel to a country with sustained community transmission and/or based on the patterns of travel between those countries and Australia, and/or the other epidemiological evidence.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door

should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.

- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practises and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practises that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information)**.**

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a "surgical" face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen.

Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify

their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Returned Traveller definition

Returned travellers who, in the last 14 days, have left or transited through a listed country that is considered to pose an increased risk of transmission.

Within any risk category, different recommendations may apply in management. See detail below.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country. Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who, in the last 14 days, have travelled in or transited through **the remaining countries considered to pose a risk of transmission** should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Returned travellers who, in the last 14 days, have travelled in or transited through **any of the countries considered to pose a risk of transmission who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases. Table 1 below summarises the recommendations for travellers returning from each at risk country by risk category.

Special risk settings

Healthcare workers (including in residential and aged care facilities)

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers should observe usual infection prevention and control practises in the workplace.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above. Table 1 below summarises the recommendations for healthcare workers returning from each at risk country by risk category.

Table 1: Actions for travellers and healthcare workers returning from countries considered to pose a risk of transmission.

Risk	Country	General actions	Action for Hospital and/or Residential/Aged Care facilities*
Higher risk	Mainland China Iran	Self-quarantine for 14 days	No work for 14 days
Higher risk	Italy South Korea	Self-monitor for 14 days Practise social distancing Isolate if unwell	No work for 14 days
Moderate risk	Cambodia Hong Kong Indonesia Japan Singapore Thailand	Self-monitor for 14 days Practise social distancing Isolate if unwell	Can return to work if well

*People working in hospitals or aged/residential care facilities who have patient contact.

Healthcare workers who are close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare or residential/aged care facility for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support

and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.

- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/ oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a flexible nasopharyngeal swab into one nostril and gently insert it along the floor of the nasal cavity parallel to the palate until resistance is encountered, rotate gently for 10-15 seconds, then withdraw and repeat the process in the other nostril with the same swab to absorb secretions
    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - place swabs back into the accompanying transport media

As a minimum standard recommendation across all jurisdictions, a nasopharyngeal and an oropharyngeal swab should both be collected, and placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

Details of practise above this minimum may vary between jurisdictions, e.g. pooling both swabs in a single container of transport medium; use of a single swab for collection of both nasopharyngeal and oropharyngeal samples; collection of two nasopharyngeal swabs and one oropharyngeal sample. Liaison with the jurisdiction's PHLN-member laboratory is recommended to obtain clarity on local variations.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then both nasopharyngeal and oropharyngeal samples should be forwarded for SARS-CoV-2 testing. Use of one swab for respiratory virus testing, and the other for SARS-CoV-2 testing is not recommended.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practises and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practises, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (eg NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than 2019-nCoV. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
    - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
    - long-sleeved gown
    - P2/N95 respirator (mask) – should be fit-checked with each use
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
    - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment

			(PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or

expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus which causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

A. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel to (including transit through) a country considered to pose a risk of transmission* in the 14 days before the onset of illness.

OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

OR

- Acute respiratory infection (e.g. shortness of breath or cough) with or without fever.

B. If the patient has severe community-acquired pneumonia (critically ill) and no other cause is identified, with or without recent international travel, they are classified as a suspect case.

C. If the patient has moderate or severe community-acquired pneumonia (hospitalised) and is a healthcare worker, with or without international travel, they are classified as a suspect case.

*Country transmission risk assessment

Higher risk:

Mainland China
Iran
Italy
South Korea

Moderate Risk:

Cambodia
Hong Kong
Indonesia

Japan
Singapore
Thailand

This list is based on the risk of the person having been exposed to COVID-19 due to travel to a country with sustained community transmission and/or based on the patterns of travel between those countries and Australia, and/or the other epidemiological evidence.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document. The same monitoring and revision applies for epidemiological criteria as new areas of varying risk emerge outside mainland China.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door

should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.

- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practises and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practises that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information)**.**

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a "surgical" face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

For cases who remain persistently PCR positive in faecal samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

It is recommended that people who are persistently PCR positive in their faeces use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

6. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

7. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of "close contacts" and "casual contacts" following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or
- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room).
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- All crew-members on an aircraft who worked in the same cabin area as a confirmed case of COVID-19. If a crew member is the COVID-19 case, contact tracing efforts should

concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours. This will include healthcare workers, other patients, or visitors who were in the same closed healthcare space as a case, but for shorter periods than those required for a close contact. Other closed settings might include schools or offices.

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts. However, these people should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition).
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Returned Traveller definition

Returned travellers who, in the last 14 days, have left or transited through a listed country that is considered to pose an increased risk of transmission.

Within any risk category, different recommendations may apply in management. See detail below.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers

Returned travellers who have travelled in or transited through **mainland China, Iran or South Korea** should self-quarantine at home for 14 days after leaving the higher risk country. Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who, in the last 14 days, have travelled in or transited through **the remaining countries considered to pose a risk of transmission** should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Returned travellers who, in the last 14 days, have travelled in or transited through **any of the countries considered to pose a risk of transmission who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases. Table 1 below summarises the recommendations for travellers returning from each at risk country by risk category.

Special risk settings

Healthcare workers (including in residential and aged care facilities)

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers should observe usual infection prevention and control practises in the workplace.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above. Table 1 below summarises the recommendations for healthcare workers returning from each at risk country by risk category.

Table 1: Actions for travellers and healthcare workers returning from countries considered to pose a risk of transmission.

Risk	Country	General actions	Action for Hospital and/or Residential/Aged Care facilities*
Higher risk	Mainland China Iran South Korea	Self-quarantine for 14 days	No work for 14 days
Higher risk	Italy	Self-monitor for 14 days Practise social distancing Isolate if unwell	No work for 14 days

Risk	Country	General actions	Action for Hospital and/or Residential/Aged Care facilities*
Moderate risk	Cambodia Hong Kong Indonesia Japan Singapore Thailand	Self-monitor for 14 days Practise social distancing Isolate if unwell	Can return to work if well

*People working in hospitals or aged/residential care facilities who have patient contact.

Healthcare workers who are close contacts (i.e. persons exposed while unprotected, as described in the Contact definition section) should be advised not to undertake work in a healthcare or residential/aged care facility for 14 days following the last possible contact with the case. They should also be advised to self-quarantine at home for 14 days following the last contact with the case.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the

individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

8. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.

- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

9. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

10. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/ oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a flexible nasopharyngeal swab into one nostril and gently insert it along the floor of the nasal cavity parallel to the palate until resistance is encountered, rotate gently for 10-15 seconds, then withdraw and repeat the process in the other nostril with the same swab to absorb secretions
    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - place swabs back into the accompanying transport media

As a minimum standard recommendation across all jurisdictions, a nasopharyngeal and an oropharyngeal swab should both be collected, and placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

Details of practise above this minimum may vary between jurisdictions, e.g. pooling both swabs in a single container of transport medium; use of a single swab for collection of both nasopharyngeal and oropharyngeal samples; collection of two nasopharyngeal swabs and one oropharyngeal sample. Liaison with the jurisdiction's PHLN-member laboratory is recommended to obtain clarity on local variations.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then both nasopharyngeal and oropharyngeal samples should be forwarded for SARS-CoV-2 testing. Use of one swab for respiratory virus testing, and the other for SARS-CoV-2 testing is not recommended.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practises and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practises, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (eg NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than 2019-nCoV. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients) – as occurred with SARS and MERS - the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step - detergent clean, followed by disinfectant; or 2-in-1 step - using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.

1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

A. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- International travel in the 14 days before illness onset.

OR

- Close or casual contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

OR

- Acute respiratory infection (e.g. shortness of breath, cough, sore throat) with or without fever.

B. If the patient has bilateral severe community-acquired pneumonia (critically ill*) and no other cause is identified, with or without recent international travel, they are classified as a suspect case.

*requiring care in ICU/HDU, or for patients in which ICU care is not appropriate, respiratory or multiorgan failure. Clinical judgement should be exercised considering the likelihood of COVID-19.

C. If the patient has moderate or severe community-acquired pneumonia (hospitalised) and is a healthcare worker, with or without international travel, they are classified as a suspect case.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect throat or nasopharyngeal swab stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory viruses, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practises and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practises that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV. Distinction is made between close contacts and casual contacts.

Identification of contacts

All persons categorised as a contact (see definitions of “close contacts” and “casual contacts” following) of confirmed cases should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or
- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts.

Casual contact definition

Casual contact is defined as any person having less than 15 minutes face-to-face contact with a symptomatic confirmed case in any setting, or sharing a closed space with a symptomatic confirmed case for less than 2 hours.

Healthcare workers who have used appropriate PPE effectively are not considered to be at risk of exposure. However, in case of unknown PPE breach, they should be advised to self-monitor and if they develop symptoms consistent with COVID-19 they should isolate themselves and notify their public health unit or staff health unit so they can be tested and managed as a suspected COVID-19 case (see recommendations below under Management of symptomatic contacts).

Other casual contacts may include:

- Extended family groups, e.g. in an Aboriginal community.
- Aircraft passengers who were not seated nearby a symptomatic confirmed case or a crew-member who did not work in the same cabin area as a symptomatic confirmed case (see close contact definition). See Special situations for further information.
- Passengers and crew onboard the same cruise ship as a symptomatic confirmed case (or cases), who are not considered to be close contacts. See Special situations for further information.

Where resources permit, more active contact tracing may be extended to other persons who have had casual contact (as defined above), particularly in school, office or other closed settings. In these circumstances, the size of the room/space and degree of separation of the case from others should be considered in identifying contacts.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Different recommendations apply in management based on the risk assessment for different countries (see detail below and Table 1 for a summary).

Country transmission risk assessment

Higher risk:

Mainland China
Iran
Italy
South Korea

Moderate risk:

All other locations outside Australia

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Casual contacts

Casual contacts should monitor their health for 14 days and report any symptoms immediately to the local public health unit. There are no restrictions on movements; however, casual contacts should be advised to isolate themselves and contact the public health unit if they develop symptoms.

Returned travellers

Returned travellers who have travelled in or transited through **mainland China, Iran or South Korea** should self-quarantine at home for 14 days after leaving the higher risk country. Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel in the last 14 days should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases. Table 1 below summarises the recommendations for travellers returning from overseas.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practises in the workplace. This includes healthcare workers and other staff in any setting with direct patient contact.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Staff (including Healthcare workers) who have patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above. Table 1 below summarises the recommendations for healthcare workers returning from overseas.

Table 1: Actions for travellers and healthcare workers returning from overseas.

Risk	Country	General actions	Action for Hospital and/or Residential/Aged Care facilities*
Higher risk**	Mainland China Iran South Korea	Self-quarantine for 14 days	No work for 14 days
Higher risk**	Italy	Self-monitor for 14 days Practise social distancing Isolate if unwell	No work for 14 days
Moderate risk	All other countries	Self-monitor for 14 days Practise social distancing Isolate if unwell	Can return to work if well

*People working in hospitals or aged/residential care facilities who have patient contact.
** Travelled or transited through.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, most aircraft crew can be considered casual contacts; however, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed case
- Duration of exposure to confirmed case
- Size of the compartment in which the crew member and confirmed case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the local public health unit to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks. The *Guidelines for the Prevention, Control and Public Health Management of Influenza Outbreaks in Residential Care Facilities in Australia* details useful principles on prevention, control, and management of respiratory disease outbreaks which could be applied to outbreaks of COVID-19 in these facilities (available at: https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-flu-guidelines.htm). Specific guidelines for COVID-19 outbreaks in residential care facilities are currently pending, and this advice will be updated accordingly upon their finalisation.

Schools

Schools are prone to rapid transmission of viruses. The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible. Children or staff with confirmed COVID-19 must not return to school until they meet the release from isolation criteria.

Note: Full or partial school closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing, if clinically appropriate, is to exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) Serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal swab and/ oropharyngeal swab, Dacron or Rayon, flocked preferred

    - nasopharyngeal: insert a flexible nasopharyngeal swab into one nostril and gently insert it along the floor of the nasal cavity parallel to the palate until resistance is encountered, rotate gently for 10-15 seconds, then withdraw and repeat the process in the other nostril with the same swab to absorb secretions
    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - place swabs back into the accompanying transport media

As a minimum standard recommendation across all jurisdictions, a nasopharyngeal and an oropharyngeal swab should both be collected, and placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

Details of practise above this minimum may vary between jurisdictions, e.g. pooling both swabs in a single container of transport medium; use of a single swab for collection of both nasopharyngeal and oropharyngeal samples; collection of two nasopharyngeal swabs and one oropharyngeal sample. Liaison with the jurisdiction's PHLN-member laboratory is recommended to obtain clarity on local variations.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then both nasopharyngeal and oropharyngeal samples should be forwarded for SARS-CoV-2 testing. Use of one swab for respiratory virus testing, and the other for SARS-CoV-2 testing is not recommended.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples (to be collected in hospital and/or using airborne precautions)

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practises and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper respiratory tract sample is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practises, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing, sonicating). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral & testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated Chinese nucleic acid sequence of SARS-CoV-2 early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than in a confirmatory role in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

No Quality Assurance Program (QAP) is currently available internationally specific for SARS-CoV-2, although QAPs are available in Australia for respiratory viruses including coronaviruses other than 2019-nCoV. The RCPAQAP with Commonwealth support will introduce a SARS-CoV-2 specific QAP to supplement previously available SARS-CoV, MERS-CoV and other coronaviruses, during the first half of 2020.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
    - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
    - long-sleeved gown
    - P2/N95 respirator (mask) – should be fit-checked with each use
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
    - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.

1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

A. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- International travel in the 14 days before illness onset.

OR

- Close contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever.

OR

- Acute respiratory infection (e.g. shortness of breath, cough, sore throat) with or without fever.

B. If the patient has severe bilateral community-acquired pneumonia (critically ill*) and no other cause is identified, with or without recent international travel, they are classified as a suspect case.

*requiring care in ICU/HDU, or for patients in which ICU care is not appropriate, respiratory or multiorgan failure. Clinical judgement should be exercised considering the likelihood of COVID-19.

C. If any healthcare worker with direct patient contact has a fever (≥37.5) AND an acute respiratory infection (e.g. shortness of breath, cough, sore throat), they are classified as a suspect case (see Healthcare workers for further information).

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect combined nasopharyngeal/nasal and oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV.

Identification of contacts

All persons categorised as close contacts (see definition of "close contacts" below) of a confirmed case should be followed-up, and monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period).

Contacts of suspected cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or
- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Different recommendations apply in management based on the risk assessment for different countries (see detail below and Table 1 for a summary).

Country transmission risk assessment

Higher risk:

Mainland China
Iran
Italy
South Korea

Moderate risk:

All other locations outside Australia

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

Returned travellers who have travelled in or transited through **mainland China, Iran, Italy or South Korea** should self-quarantine at home for 14 days after leaving the higher risk country. Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel in the last 14 days should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases. Table 1 below summarises the recommendations for travellers returning from overseas.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever AND acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services an individual risk assessment should be conducted in collaboration with the PHU.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above. Table 1 below summarises the recommendations for healthcare workers returning from overseas.

Table 1: Actions for travellers and healthcare workers returning from overseas.

Risk	Country	General actions	Action for Hospital and/or Residential/Aged Care facilities*
Higher risk**	Mainland China Iran South Korea Italy	Self-quarantine for 14 days	No work for 14 days
Moderate risk	All other countries	Self-monitor for 14 days Practise social distancing Isolate if unwell	Can return to work if well

*People working in hospitals or aged/residential care facilities who have patient contact.
**Travelled or transited through.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Self-quarantine at home should be recommended for close contacts where this is feasible (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For close contacts for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed case
- Duration of exposure to confirmed case
- Size of the compartment in which the crew member and confirmed case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.

- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks. The *Guidelines for the Prevention, Control and Public Health Management of Influenza Outbreaks in Residential Care Facilities in Australia* details useful principles on prevention, control, and management of respiratory disease outbreaks which could be applied to outbreaks of COVID-19 in these facilities (available at: https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-flu-guidelines.htm). Specific guidelines for COVID-19 outbreaks in residential care facilities are currently pending, and this advice will be updated accordingly upon their finalisation.

Schools

Schools are prone to rapid transmission of viruses. The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible. Children or staff with confirmed COVID-19 must not return to school until they meet the release from isolation criteria.

Note: Full or partial school closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal and oropharyngeal swab: may be dacron or rayon, although flocked preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - nasopharyngeal: swab the right or left nasopharynx by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasopharynx sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, oropharynx and also the nasopharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies. Dry swabs are not recommended.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Non-respiratory specimens (blood, urine, stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aersol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP) with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid 2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.

1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

A. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- International travel in the 14 days before illness onset.

OR

- Close contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills).

OR

- Acute respiratory infection (e.g. shortness of breath, cough, sore throat) with or without fever.

B. If the patient has bilateral community-acquired pneumonia (critically ill[2]) and no other cause is identified, with or without recent international travel, they are classified as a suspect case.

C. If any healthcare worker with direct patient contact has a fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) AND an acute respiratory infection (e.g. shortness of breath, cough, sore throat), they are classified as a suspect case (see Healthcare workers for further information).

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent core body temperature.

[2] Requiring care in ICU/HDU, or for patients in which ICU care is not appropriate, respiratory or multiorgan failure. Clinical judgement should be exercised considering the likelihood of COVID-19.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect combined nasopharyngeal/nasal and oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

A confirmed case can be released from isolation if they meet all of the following criteria:

- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- be at least 7 days after the onset of the acute illness;
- PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2,3].

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health. Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV.

Identification of contacts

Persons categorised as close contacts (see definition of "close contacts" below) of a confirmed case should be followed-up and provided with information; close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or
- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.

- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Where feasible to do so, public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All returned travellers who have undertaken international travel and returned on or after **16 March 2020** should self-quarantine at home for 14 days after arrival in Australia.

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **Italy** on or after 11 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **South Korea** on or after 5 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel prior to 16 March 2020, and are not required to self-quarantine as per the advice above, should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell. This advice should be followed for 14 days after returning to Australia.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever AND acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services an individual risk assessment should be conducted in collaboration with the PHU.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Close contacts arriving prior to 16 March 2020, and any returned travellers arriving on or after 16 March 2020, should self-quarantine. Where feasible, self-quarantine at home should be recommended, (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For those for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed case
- Duration of exposure to confirmed case
- Size of the compartment in which the crew member and confirmed case interacted

- Precautions taken, including PPE worn, when in close proximity to the confirmed case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal and oropharyngeal swab: may be dacron or rayon, although flocked preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - nasopharyngeal: swab the right or left nasopharynx by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasopharynx sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, oropharynx and also the nasopharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies. Dry swabs are not recommended.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Non-respiratory specimens (blood, urine, stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aersol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP) with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid 2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.

1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Suspect case

A. If the patient satisfies epidemiological and clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- International travel in the 14 days before illness onset.

OR

- Close contact (see Contact definition below) in 14 days before illness onset with a confirmed case of COVID-19.

Clinical criteria

- Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills).

OR

- Acute respiratory infection (e.g. shortness of breath, cough, sore throat) with or without fever.

B. If the patient has bilateral community-acquired pneumonia (critically ill[2]) and no other cause is identified, with or without recent international travel, they are classified as a suspect case.

C. If any healthcare worker with direct patient contact has a fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) AND an acute respiratory infection (e.g. shortness of breath, cough, sore throat), they are classified as a suspect case (see Healthcare workers for further information).

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent core body temperature.

[2] Requiring care in ICU/HDU, or for patients in which ICU care is not appropriate, respiratory or multiorgan failure. Clinical judgement should be exercised considering the likelihood of COVID-19.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect combined nasopharyngeal/nasal and oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
    - given a surgical mask to put on, and
    - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

1. Confirmed cases with mild illness who did not require hospitalization.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

   The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

2. Confirmed cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has not had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-02 by PCR, then they should be discharged to home isolation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

   The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

3. All cases who have specimens taken at clinical recovery can be released from isolation if they meet the criteria below.

   Healthcare workers and workers in aged care facilities must meet the following criteria for release from isolation.

   A confirmed case can be released from isolation if they meet all of the following criteria:

   - the person has been afebrile for the previous 48 hours;
   - resolution of the acute illness for the previous 24 hours[1];
   - be at least 7 days after the onset of the acute illness;
   - PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2, 3] – this will be reviewed as the pandemic evolves in Australia.

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health, Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV.

Identification of contacts

Persons categorised as close contacts (see definition of “close contacts” below) of a confirmed case should be followed-up and provided with information; close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or

- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Where feasible to do so, public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All returned travellers who have undertaken international travel and returned on or after **16 March 2020** should self-quarantine at home for 14 days after arrival in Australia.

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **Italy** on or after 11 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **South Korea** on or after 5 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel prior to 16 March 2020, and are not required to self-quarantine as per the advice above, should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell. This advice should be followed for 14 days after returning to Australia.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever AND acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services an individual risk assessment should be conducted in collaboration with the PHU.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Close contacts arriving prior to 16 March 2020, and any returned travellers arriving on or after 16 March 2020, should self-quarantine. Where feasible, self-quarantine at home should be recommended, (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For those for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed case
- Duration of exposure to confirmed case
- Size of the compartment in which the crew member and confirmed case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.

- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal and oropharyngeal swab: may be dacron or rayon, although flocked preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - nasopharyngeal: swab the right or left nasopharynx by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasopharynx sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, oropharynx and also the nasopharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies. Dry swabs are not recommended.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Non-respiratory specimens (blood, urine, stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aersol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP) with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid 2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.

1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Probable case

A person with fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat) **AND** who is a household contact of a confirmed case of COVID-19, where testing has not been conducted.

Suspect case

A person who meets the following epidemiological and clinical criteria:

Epidemiological criteria	**Clinical criteria**	**Action**
Very high risk • Close contact (see Contact definition below) in the 14 days prior to illness onset with a confirmed case • International travel in the 14 days prior to illness onset • Cruise ship passengers and crew who have travelled in the 14 days prior to illness onset	Fever (≥38°C)[1] or history of fever **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test[2]
High risk setting 1. Two or more cases of illness clinically consistent with COVID-19 (see clinical criteria) in the following settings: • Aged care and other residential care facilities • Military operational settings • Boarding schools • Correctional facilities • Detention centres • Aboriginal rural and remote communities, in consultation with the local PHU • Settings where COVID-19 outbreaks have occurred, in consultation with the local PHU 2. Individual patients with illness clinically consistent with COVID-19 (see clinical criteria) in a geographically localised area with elevated risk of community transmission, as defined by PHUs	Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test (on site for aged care residents, where feasible)

Moderate risk • Healthcare workers, aged or residential care workers	Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test
Background risk (No epidemiological risk factors)	Hospitalised patients with fever (≥38°C)[1] **AND** acute respiratory symptoms (e.g. cough, shortness of breath, sore throat)[3] of an unknown cause	Test

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent core body temperature.

[2] Testing household contacts of confirmed cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (see definition above).

[3] Clinical judgement should be exercised in testing hospitalised patients. All patients should attend an emergency department if clinical deterioration occurs.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.

- To collect combined nasopharyngeal/nasal and oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a suspected or confirmed case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with suspected and confirmed cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of suspected and confirmed cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with suspected or confirmed COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
  - given a surgical mask to put on, and
  - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

1. Confirmed cases with mild illness who did not require hospitalization.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

   The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

2. Confirmed cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has not had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-02 by PCR, then they should be discharged to home isolation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

3. <u>All cases who have specimens taken at clinical recovery can be released from isolation if they meet the criteria below.</u>

   <u>Healthcare workers and workers in aged care facilities must meet the following criteria for release from isolation.</u>

   A confirmed case can be released from isolation if they meet all of the following criteria:

   - the person has been afebrile for the previous 48 hours;
   - resolution of the acute illness for the previous 24 hours[1];
   - be at least 7 days after the onset of the acute illness;
   - PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2, 3] – this will be reviewed as the pandemic evolves in Australia.

   [1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

   [2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

   [3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health, Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.

- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV.

Identification of contacts

Persons categorised as close contacts (see definition of "close contacts" below) of a confirmed case should be followed-up and provided with information; close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspected case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, or
- sharing of a closed space with a confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel).
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.

- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed COVID-19 case.

Where feasible to do so, public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All returned travellers who have undertaken international travel and returned on or after **16 March 2020** should self-quarantine at home for 14 days after arrival in Australia.

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **Italy** on or after 11 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **South Korea** on or after 5 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel prior to 16 March 2020, and are not required to self-quarantine as per the advice above, should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell. This advice should be followed for 14 days after returning to Australia.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever AND acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services an individual risk assessment should be conducted in collaboration with the PHU.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing suspected, confirmed COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of suspect or confirmed cases

If suspect or confirmed cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Close contacts arriving prior to 16 March 2020, and any returned travellers arriving on or after 16 March 2020, should self-quarantine. Where feasible, self-quarantine at home should be recommended, (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For those for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all suspect and confirmed cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed case
- Duration of exposure to confirmed case
- Size of the compartment in which the crew member and confirmed case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal and oropharyngeal swab: may be dacron or rayon, although flocked preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - nasopharyngeal: swab the right or left nasopharynx by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasopharynx sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, oropharynx and also the nasopharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies. Dry swabs are not recommended.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Non-respiratory specimens (blood, urine, stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aersol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP) with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid 2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with suspected or confirmed COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with suspected or confirmed COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
    - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
    - long-sleeved gown
    - P2/N95 respirator (mask) – should be fit-checked with each use
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
    - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.

1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Probable case

A person with fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat) **AND** who is a household contact (see Contact definition below) of a confirmed or probable case of COVID-19, where testing has not been conducted.

Suspect case

A person who meets the following epidemiological and clinical criteria:

Epidemiological criteria	Clinical criteria	Action
Very high risk • Close contact (see Contact definition below) in the 14 days prior to illness onset with a confirmed or probable case • International travel in the 14 days prior to illness onset • Cruise ship passengers and crew who have travelled in the 14 days prior to illness onset	Fever (≥38°C)[1] or history of fever **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test[2]
High risk setting 1. Two or more cases of illness clinically consistent with COVID-19 (see clinical criteria) in the following settings: • Aged care and other residential care facilities • Military operational settings • Boarding schools • Correctional facilities • Detention centres • Aboriginal rural and remote communities, in consultation with the local PHU • Settings where COVID-19 outbreaks have occurred, in consultation with the local PHU 2. Individual patients with illness clinically consistent with COVID-19 (see clinical criteria) in a geographically localised area with elevated risk of community transmission, as defined by PHUs	Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test (on site for aged care residents, where feasible)

Moderate risk • Healthcare workers, aged or residential care workers	Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test
Background risk (No epidemiological risk factors)	Hospitalised patients with fever (≥38°C)[1] **AND** acute respiratory symptoms (e.g. cough, shortness of breath, sore throat)[3] of an unknown cause	Test

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent core body temperature.

[2] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (see definition above).

[3] Clinical judgement should be exercised in testing hospitalised patients. All patients should attend an emergency department if clinical deterioration occurs.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.

- To collect combined nasopharyngeal/nasal and oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of confirmed, probable, and suspect cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
  - given a surgical mask to put on, and
  - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed or probable COVID-19 needs to be transferred out of their isolation room, the patient should wear a "surgical" face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

1. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

   The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

2. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has not had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-02 by PCR, then they should be discharged to home isolation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and

- there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

3. <u>All cases who have specimens taken at clinical recovery can be released from isolation if they meet the criteria below.</u>

   <u>Healthcare workers and workers in aged care facilities must meet the following criteria for release from isolation.</u>

   A confirmed or probable case can be released from isolation if they meet all of the following criteria:

   - the person has been afebrile for the previous 48 hours;
   - resolution of the acute illness for the previous 24 hours[1];
   - be at least 7 days after the onset of the acute illness;
   - PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2, 3] – this will be reviewed as the pandemic evolves in Australia.

   [1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

   [2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

   [3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health, Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV.

Identification of contacts

Persons categorised as close contacts (see definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last contact with the case. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed or probable case in the period extending from 24 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.

- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All returned travellers who have undertaken international travel and returned on or after **16 March 2020** should self-quarantine at home for 14 days after arrival in Australia.

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **Italy** on or after 11 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **South Korea** on or after 5 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel prior to 16 March 2020, and are not required to self-quarantine as per the advice above, should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell. This advice should be followed for 14 days after returning to Australia.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever OR acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services an individual risk assessment should be conducted in collaboration with the PHU.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed or probable cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Close contacts arriving prior to 16 March 2020, and any returned travellers arriving on or after 16 March 2020, should self-quarantine. Where feasible, self-quarantine at home should be recommended, (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For those for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal and oropharyngeal swab: may be dacron or rayon, although flocked preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - nasopharyngeal: swab the right or left nasopharynx by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasopharynx sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, oropharynx and also the nasopharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies. Dry swabs are not recommended.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Non-respiratory specimens (blood, urine, stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aersol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP) with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid 2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with confirmed, probable, or suspected COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with confirmed, probable or suspected COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
    - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
    - long-sleeved gown
    - P2/N95 respirator (mask) – should be fit-checked with each use
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
    - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.5	06 April 2020	Communicable Disease Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.

1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Probable case

A person, who has not been tested, with fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat) **AND** who is a household contact (see Contact definition below) of a confirmed or probable case of COVID-19.

Suspect case

A person who meets the following epidemiological and clinical criteria:

Epidemiological criteria	Clinical criteria	Action
Very high risk • Close contact (see Contact definition below) in the 14 days prior to illness onset with a confirmed or probable case • International travel in the 14 days prior to illness onset • Cruise ship passengers and crew who have travelled in the 14 days prior to illness onset	Fever (≥38°C)[1] or history of fever **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test[2]
High risk setting 1. Two or more plausibly-linked cases of illness clinically consistent with COVID-19 (see clinical criteria) in the following settings: • Aged care and other residential care facilities • Military – group residential and other closed settings, such as Navy ships or living in accommodation • Boarding schools • Correctional facilities • Detention centres • Aboriginal and Torres Strait Islander rural and remote communities, in consultation with the local PHU • Settings where COVID-19 outbreaks have occurred, in consultation with the local PHU 2. People who, in the 14 days prior to illness onset lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[4]	Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[3]	Test (on site for aged care residents, where feasible)

Epidemiological criteria	Clinical criteria	Action
Moderate risk • Healthcare workers, aged or residential care workers	Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test
Background risk (No epidemiological risk factors)	Hospitalised patients with fever (≥38°C)[1] **AND** acute respiratory symptoms (e.g. cough, shortness of breath, sore throat)[5] of an unknown cause	Test

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent core body temperature.

[2] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (see definition above).

[3] In certain high risk outbreak settings, public health units may consider testing asymptomatic contacts to inform management of the outbreak.

[4] For further information on geographically localised areas with elevated risk of community transmission, see: https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm

[5] Clinical judgement should be exercised in testing hospitalised patients. All patients should attend an emergency department if clinical deterioration occurs.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect combined nasopharyngeal/nasal and oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of confirmed, probable, and suspect cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
  - given a surgical mask to put on, and
  - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed or probable COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

1. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

2. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has not had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-02 by PCR, then they should be discharged to home isolation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

   The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

3. All cases who have specimens taken at clinical recovery can be released from isolation if they meet the criteria below.

   Healthcare workers and workers in aged care facilities must meet the following criteria for release from isolation.

   A confirmed or probable case can be released from isolation if they meet all of the following criteria:

   - the person has been afebrile for the previous 48 hours;
   - resolution of the acute illness for the previous 24 hours[1];
   - be at least 7 days after the onset of the acute illness;
   - PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2, 3] – this will be reviewed as the pandemic evolves in Australia.

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health, Results of viral culture, if available, may be included in this consideration.

Follow up should include the person being reviewed seven days after release from isolation for:

- clinical review to ensure full symptom resolution
- collection of a serum specimen for storage and possible later serologic testing (the person should be informed that this is for future test development and does not inform their clinical care).

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 24-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV.

Identification of contacts

Persons categorised as close contacts (see definition of “close contacts” below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last contact with the case. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contact definition

A close contact is defined as requiring:

- greater than 15 minutes face-to-face contact in any setting with a confirmed or probable case in the period extending from before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 24 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).
Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All returned travellers who have undertaken international travel and returned on or after **16 March 2020** should self-quarantine at home for 14 days after arrival in Australia.

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **Italy** on or after 11 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **South Korea** on or after 5 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel prior to 16 March 2020, and are not required to self-quarantine as per the advice above, should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell. This advice should be followed for 14 days after returning to Australia.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social

distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever OR acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services an individual risk assessment should be conducted in collaboration with the PHU.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed or probable cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Close contacts arriving prior to 16 March 2020, and any returned travellers arriving on or after 16 March 2020, should self-quarantine. Where feasible, self-quarantine at home should be recommended, (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are

employed during travel. For those for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.

- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal and oropharyngeal swab: may be dacron or rayon, although flocked preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - nasopharyngeal: swab the right or left nasopharynx by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasopharynx sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, oropharynx and also the nasopharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies. Dry swabs are not recommended.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Non-respiratory specimens (blood, urine, stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aersol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP) with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid 2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with confirmed, probable, or suspected COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with confirmed, probable or suspected COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
    - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
    - long-sleeved gown
    - P2/N95 respirator (mask) – should be fit-checked with each use
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
    - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.6	17 April 2020	Communicable Disease Network Australia	Revised: Case management, Contact management – Close contact definition
2.5	06 April 2020	Communicable Disease Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.

1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Probable case

A person, who has not been tested, with fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat) **AND** who is a household contact (see Contact definition below) of a confirmed or probable case of COVID-19.

Suspect case

A person who meets the following epidemiological and clinical criteria:

Epidemiological criteria	Clinical criteria	Action
Very high risk • Close contact (see Contact definition below) in the 14 days prior to illness onset with a confirmed or probable case • International travel in the 14 days prior to illness onset • Cruise ship passengers and crew who have travelled in the 14 days prior to illness onset	Fever (≥38°C)[1] or history of fever **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test[2]
High risk setting 1. Two or more plausibly-linked cases of illness clinically consistent with COVID-19 (see clinical criteria) in the following settings: • Aged care and other residential care facilities • Military – group residential and other closed settings, such as Navy ships or living in accommodation • Boarding schools • Correctional facilities • Detention centres • Aboriginal and Torres Strait Islander rural and remote communities, in consultation with the local PHU • Settings where COVID-19 outbreaks have occurred, in consultation with the local PHU 2. People who, in the 14 days prior to illness onset lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[4]	Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[3]	Test (on site for aged care residents, where feasible)

Epidemiological criteria	Clinical criteria	Action
Moderate risk • Healthcare workers, aged or residential care workers	Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)	Test
Background risk (No epidemiological risk factors)	Hospitalised patients with fever (≥38°C)[1] **AND** acute respiratory symptoms (e.g. cough, shortness of breath, sore throat)[5] of an unknown cause	Test

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent core body temperature.

[2] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (see definition above).

[3] In certain high risk outbreak settings, public health units may consider testing asymptomatic contacts to inform management of the outbreak.

[4] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

[5] Clinical judgement should be exercised in testing hospitalised patients. All patients should attend an emergency department if clinical deterioration occurs.

Rationale for current case definitions

The case definitions are based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting to date both in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms as cases arise, and, if there are any significant shifts, they will be reflected in the above definitions in future versions of this document.

The 14 day period is based upon what is currently known to be the upper time limit of the incubation period. As more precise information about the incubation period emerges, this will be reviewed.

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect combined nasopharyngeal/nasal and oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of confirmed, probable, and suspect cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
  - given a surgical mask to put on, and
  - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed or probable COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

1. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

2. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has not had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-02 by PCR, then they should be discharged to home isolation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1]

   The case should be advised to continue to be diligent to hand hygiene and cough etiquette and practise social distancing, as is indicated for the rest of the community, as this will assist in reducing transmission.

3. All cases who have specimens taken at clinical recovery can be released from isolation if they meet the criteria below.

   Healthcare workers and workers in aged care facilities must meet the following criteria for release from isolation.

   A confirmed or probable case can be released from isolation if they meet all of the following criteria:

   - the person has been afebrile for the previous 48 hours;
   - resolution of the acute illness for the previous 24 hours[1];
   - be at least 7 days after the onset of the acute illness;
   - PCR negative on at least two consecutive respiratory specimens collected 24 hours apart after the acute illness has resolved[2, 3] – this will be reviewed as the pandemic evolves in Australia.

[1]Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2]If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[3]A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. A decision on release from isolation for these people should be made on a case-by-case basis after consultation between the person's treating medical practitioner, the testing laboratory and public health, Results of viral culture, if available, may be included in this consideration.

Routine PCR testing at seven days after release is not recommended unless the person has clinical features consistent with COVID-19.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 48-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV.

Identification of contacts

Persons categorised as close contacts (see definition of “close contacts” below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last contact with the case. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).
Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings (see suspect case definition), public health units may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All returned travellers who have undertaken international travel and returned on or after **16 March 2020** should self-quarantine at home for 14 days after arrival in Australia.

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **Italy** on or after 11 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **South Korea** on or after 5 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel prior to 16 March 2020, and are not required to self-quarantine as per the advice above, should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell. This advice should be followed for 14 days after returning to Australia.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever OR acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services an individual risk assessment should be conducted in collaboration with the PHU.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed or probable cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Close contacts arriving prior to 16 March 2020, and any returned travellers arriving on or after 16 March 2020, should self-quarantine. Where feasible, self-quarantine at home should be recommended, (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For those for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.

- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal and oropharyngeal swab: may be dacron or rayon, although flocked preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - nasopharyngeal: swab the right or left nasopharynx by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasopharynx sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, oropharynx and also the nasopharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies. Dry swabs are not recommended.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Non-respiratory specimens (blood, urine, stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aersol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP) with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid 2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with confirmed, probable, or suspected COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with confirmed, probable or suspected COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.7	24 April 2020	Communicable Disease Network Australia	Revised: Case definition, Case management
2.6	17 April 2020	Communicable Disease Network Australia	Revised: Case management, Contact management – Close contact definition
2.5	06 April 2020	Communicable Disease Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Air crew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.

1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.

1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises interim recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). It is the first national guidance issued for COVID-19 and will be further developed into the Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units (COVID-19 SoNG).

It has been adapted from CDNA National Guidelines for Public Health Units MERS-CoV, utilising current CDC and WHO guidance, and is based on the current knowledge of the situation in mainland China and other countries, and experiences with SARS-CoV and MERS-CoV.

CDNA will review and update these recommendations as required as new information becomes available on the situation.

These interim Guidelines are to be used in the first instance whilst a Series of National Guidelines is being developed by the Communicable Diseases Network Australia (CDNA).

These interim guidelines capture the knowledge of experienced professionals, and provide guidance on best practise based upon the best available evidence at the time of completion.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the AHPPC, and the Commonwealth of Australia as represented by the Department of Health ('the Commonwealth'), do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and the Commonwealth do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organization for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020
SARS-CoV-2:	severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information see the International Committee on Taxonomy of Viruses manuscript: https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf

Contents

1. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Probable case

A person, who has not been tested, with fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat) **AND** who is a household contact (see Contact definition below) of a confirmed or probable case of COVID-19.

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical Criteria:

Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat).

Epidemiological criteria:

i. In the 14 days prior to illness onset:
- Close contact[2,3] (see Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers and crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[4]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent core body temperature.

[2] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (see definition above).

[3] In certain high risk outbreak settings, public health units may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, see high risk settings.

[4] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant State and Territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on patients with: fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat), where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent core body temperature.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. Respiratory specimens should be collected in accordance with the appropriate guidelines, refer to Revised advice on non-inpatient care of people with suspected or confirmed COVID-19, including use of personal protective equipment (PPE): (https://www.health.gov.au/resources/publications/revised-advice-on-non-inpatient-care-of-people-with-suspected-or-confirmed-covid-19-including-use-of-personal-protective-equipment-ppe)

2. Laboratory testing

Patients meeting the suspect case definition (above) should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. Where applicable, consult with your state/territory communicable diseases agency to seek advice on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also to facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. nasopharyngeal or oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect combined nasopharyngeal/nasal and oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g. fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.

Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not yet available. Collection of serum for storage by the SARS-CoV-2 testing laboratory is recommended to facilitate retrospective testing, if this is relevant, once serology tests become available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

3. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases agency.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 public health unit checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done.
- Seek the treating doctor's permission to contact the case or relevant care-giver.
- Determine if the diagnosis has been discussed with the case or relevant care-giver before beginning the interview.
- Review case and contact management.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Case treatment

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from WHO: (https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf?sfvrsn=bc7da517_2)

Education

Provide a COVID-19 factsheet to cases and their close contacts.

Ensure that they are aware of the signs and symptoms of COVID-19, the requirements of quarantine and isolation, contact details of the PHU and the infection control practices that can prevent the transmission of COVID-19.

Isolation and restriction

Cases will generally be managed in hospital. If clinically indicated, cases may be managed at home only if it can be ensured that the case and household contacts are counselled about risk and that appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspected cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment.

While recommendations on isolation and PPE for management of confirmed, probable, and suspect cases initially took a deliberately cautious approach, emerging evidence and expert advice now supports requirements commensurate with the risk in particular clinical circumstances.

In addition to standard precautions, interim recommendations for the use of PPE during clinical care of people with possible COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients in quarantine or with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures**, including intubation and bronchoscopy, and for care of **critically ill patients** (see Appendix B for further information).

Other recommended infection control measures include:

- When a patient who meets the suspect case definition presents to a healthcare setting (GP, hospital ED, or pathology collection centre) and whether or not respiratory symptoms are present, the patient should immediately be:
  - given a surgical mask to put on, and
  - directed to a single room. If the patient has severe symptoms suggestive of pneumonia, they should be directed to a negative pressure room, if available, or a room from which the air does not circulate to other areas.
- If a patient with confirmed or probable COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” face mask and follow respiratory hygiene and cough etiquette.

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from necessary isolation restrictions, as well as when cases are clear to go into high risk settings. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Cases can go into a high risk setting if they meet the criteria in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first positive sample was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has **not** had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then they can be discharged to home isolation.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

   If the case, at or prior to discharge, has had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then the case can simultaneously be discharged and released from isolation.

4. Laboratory Criteria

   Cases returning to a higher risk setting (such as working in a health care setting, living in a residential age care setting or transferred to another ward in a hospital, see full list of high risk settings below) must meet a higher standard. These people need additional assessment prior to going into the higher risk setting.

   Confirmed and probable cases who will be going into to a high-risk setting can go into that setting if they meet **all** the following criteria:

   - be at least 10 days after the onset of the acute illness;
   - the person has been afebrile for the previous 48 hours;
   - resolution of the acute illness for the previous 24 hours[1];
   - PCR negative on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset [3,4]

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved. If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation.

[2] If a case who meets these criteria is swabbed, then the case can be released from isolation irrespective of the swab test result.

[3] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (nasopharyngeal or nose and throat swabs) must be PCR negative.

[4] A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. In these circumstances, the decision around release to a high risk setting should be made on a case by case basis after discussion between the treating medical practitioner, the testing laboratory and public health. This may include laboratory interpretation of PCR cycle threshold (Ct) values and/or viral culture where available.

Routine PCR testing post-release from isolation is not recommended unless the person develops new clinical features consistent with COVID-19.

Persons who have been released from isolation should still adhere to social distancing measures, as the extent of acquired immunity is unknown.

If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (see suspect case definition) until 14 days after the last unprotected contact with the confirmed case and should vigilantly self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

High risk settings

In the context of the release from isolation criteria and some aspects of testing outlined in the case definition, high-risk settings are defined as:

- Aged care and other residential care facilities
- Healthcare settings
- Military – group residential and other closed settings, such as Navy ships or living in accommodation
- Boarding schools and other group residential settings
- Educational settings where students are present
- Childcare centres
- Correctional facilities
- Detention centres
- Workplaces where social distancing can't be readily practised
- Remote industrial sites with accommodation (e.g. mine sites)
- Aboriginal and Torres Strait Islander rural and remote communities, in consultation with the local PHU
- Settings where COVID-19 outbreaks are occurring, in consultation with the local PHU

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Aerosol-generating procedures include: tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy, and high flow nasal oxygen. Collection of upper respiratory specimens is not generally regarded as aerosol generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

4. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

5. Infectious period

Infectious period of COVID-19 remains unknown, however there is some evidence to support the occurrence of pre-symptomatic or asymptomatic transmission (1). As a precautionary approach, cases are considered to be infectious 48-hours prior to onset of symptoms. Cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

6. Contact management

As there remain gaps in the understanding of infectivity of COVID-19 cases and transmission modes, the definition of contacts and their public health management is based on available information on COVID-19 together with observations from similar serious coronaviruses – SARS-CoV and MERS-CoV.

Identification of contacts

Persons categorised as close contacts (see definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last contact with the case. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.

- A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crew member is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crew member was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious by the treating team (usually 24 hours after the resolution of symptoms).
Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned Traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

Identification and assessment of the contacts of suspected cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings (see suspect case definition), public health units may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, public health units should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All returned travellers who have undertaken international travel and returned on or after **16 March 2020** should self-quarantine at home for 14 days after arrival in Australia.

Returned travellers who have travelled in or transited through **mainland China or Iran** should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **Italy** on or after 11 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Returned travellers who have travelled in or transited through **South Korea** on or after 5 March 2020 should self-quarantine at home for 14 days after leaving the higher risk country.

Self-quarantined returned travellers should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

All returned travellers who have undertaken international travel prior to 16 March 2020, and are not required to self-quarantine as per the advice above, should self-monitor for symptoms, practise social distancing when outside the workplace and immediately isolate themselves if they become unwell. This advice should be followed for 14 days after returning to Australia.

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations and the aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspected cases.

Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever OR acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services an individual risk assessment should be conducted in collaboration with the PHU.

Self-quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

Public health units may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on healthcare worker close contacts may place strain on individuals and on health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions given they come into contact with a high case load of potentially vulnerable patients.

All healthcare workers and staff who have close patient contact in hospitals and/or residential/aged care facilities **who have returned from any higher risk country** should be advised not to undertake work in a health care or residential/aged care facility for 14 days since leaving the higher risk country. They should otherwise follow advice provided to other well returned travellers as above.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see section 7. Special situations – Aboriginal and Torres Strait Islander Communities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in self-quarantine or isolation because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local public health unit should be consulted about the most suitable venue for clinical assessment and specimen collection.

Management of symptomatic contacts

If fever or respiratory symptoms, with or without fever, or other symptoms consistent with COVID-19 develop within the first 14 days following the last contact, PHU staff should arrange for the individual to be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment which minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home, unless their condition is severe enough to require hospitalisation.

Symptomatic contacts who test negative for SARS-CoV-2 by PCR will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case and may require re-testing.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Classification of contacts on cruise ships with one or more confirmed or probable cases of COVID-19 should be made on a case-by-case basis.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a port

Close contacts arriving prior to 16 March 2020, and any returned travellers arriving on or after 16 March 2020, should self-quarantine. Where feasible, self-quarantine at home should be recommended, (e.g. persons with a residence nearby) ensuring appropriate PPE precautions are employed during travel. For those for whom this is not possible, matters of self-quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

Where it has been determined that a crew member is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Aboriginal and Torres Strait Islander communities

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication:** Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is due to the fact that there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should be primed and already have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with upper respiratory tract illness should not attend school while symptomatic. If a child or staff member becomes ill with upper respiratory tract symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

8. References

1. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med. 2020.

9. Appendices

Appendix A: SARS-CoV-2 Laboratory testing information

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Nasopharyngeal and oropharyngeal swab: may be dacron or rayon, although flocked preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - nasopharyngeal: swab the right or left nasopharynx by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasopharynx sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, oropharynx and also the nasopharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies. Dry swabs are not recommended.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate if available, may be substituted for the nasopharyngeal swab sample described above.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Clinical Pathology

Non-respiratory specimens (blood, urine, stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aersol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at: https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP) with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid 2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here.

Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19).

These recommendations are intended for hospital personnel who enter a clinical space with COVID-19 patients, including wardspersons, food delivers, cleaners, and clinical personnel.

Background:

Although Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which causes COVID-19 has spread rapidly and widely in mainland China, there has been limited transmission elsewhere, i.e. containment precautions have been mostly successful to date. At the time of writing, the crude mortality (~2%) in China is based on laboratory confirmed cases; many milder cases are almost certainly not being tested and the mortality is likely to be lower. Most cases in Australia have been relatively mild but a small number of deaths has been reported outside of mainland China. While a number of healthcare-associated infections have been reported with COVID-19 (in healthcare workers and patients)—as occurred with SARS and MERS—the risk for COVID-19 is likely to be very low, when infection control precautions are adhered to correctly.

General principles:

- **Standard precautions, including hand hygiene (5 Moments)** for all patients with respiratory infections. Patients and staff should observe cough etiquette and respiratory hygiene,
- **Transmission-based precautions** for patients with confirmed, probable, or suspected COVID-19:
    - **Contact and droplet precautions** for **routine care** of patients.
    - **Contact and airborne precautions** for **aerosol generating procedures (AGPs)**.

Contact and droplet precautions:

Contact and droplet precautions can be safely used for routine patient care of inpatients with confirmed, probable or suspected COVID-19 (see Coronavirus Disease 2019 (COVID-19) CDNA National Guidelines for Public Health Units for case definition)

- On presentation or admission to hospital the patient should be:
    - given a surgical mask to put on, and
    - placed in a single room (ensuring air does not circulate to other areas)
    - placed in a negative pressure room (in the event of AGPs being performed).
- If transfer outside the room is essential, the patient should wear a surgical mask during transfer and follow respiratory hygiene and cough etiquette.
- For most inpatient contacts between healthcare staff and patients the following PPE is safe and appropriate and should be put on before entering the patient's room:
    - long-sleeved gown
    - surgical mask
    - face shield or goggles
    - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)
- For hospitalised patients requiring frequent attendance by medical and nursing staff, a P2/N95 respirator should be considered for prolonged or very close contact.

Contact and airborne precautions for aerosol-generating procedures (AGPs) and care of clinically ill patients requiring high level/high volume hands-on contact outside of ICU:

- **Contact** and **airborne precautions should be used routinely for AGPs,** which include:
  - tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy (and bronchoalveolar lavage), high flow nasal oxygen
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used.

- PPE for contact and airborne procedures should be put on before entering patients room:
  - long-sleeved gown
  - P2/N95 respirator (mask) – should be fit-checked with each use
  - face shield or goggles
  - disposable nonsterile gloves when in contact with patient (hand hygiene before donning and after removing gloves)

- P2/N95 respirators (mask) should be used only when required.
- Unless used correctly, i.e. with fit-checking, a P2/N95 respirator (mask) is unlikely to protect against airborne pathogen spread.
  - An air-tight seal may be difficult to achieve for people with facial hair. Fit checking with a range of P2/N95 respirators must occur to assess the most suitable one to achieve a protective seal. If a tight seal cannot be achieved, facial hair should be removed.

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract
- **Contact and airborne precautions** (as above) are required for patient care and are adequate for most AGPs.
  - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit but there is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection
- If a health care professional is required to remain in the patient's room continuously for a long period (e.g. more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility. A number of different types of relatively lightweight, comfortable PAPRs are now available and should be used according to manufacturer's instructions. Only **PPE marked as reusable** should be reused, following **reprocessing** according to manufacturer's instructions, All other PPE must be disposed of after use.

  ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including by an infection control professional. This also applies particularly to the use of PAPRs, if required. Particular care should be taken on removal of PAPR, which is associated with a risk of contamination.

Additional precautions:

Staff

- A staff log for each room entry should be maintained, to allow monitoring of potential breaches of infection control and follow-up contacts, if necessary.

Disposal of PPE and other waste

- Waste should be disposed in the normal way for clinical waste
- All non-clinical waste is disposed of into general waste

Handling of linen

- Routine procedures for handling of infectious linen should be followed
- Visibly soiled linen should be placed in a (soluble) plastic bag inside a linen skip

Environmental cleaning of patient care areas

- Cleaners should observe contact and droplet precautions (as above).
- Frequently touched surfaces (such as doorknobs, bedrails, tabletops, light switches, patient handsets) in the patient's room should be cleaned daily.
- Terminal cleaning of all surfaces in the room (as above plus floor, ceiling, walls, blinds) should be performed after the patient is discharged.
- A combined cleaning and disinfection procedure should be used, either 2-step— detergent clean, followed by disinfectant; or 2-in-1 step— using a product that has both cleaning and disinfectant properties. Any hospital-grade, TGA-listed disinfectant that is commonly against norovirus is suitable, if used according to manufacturer's instructions.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.

2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
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1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.

1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, see the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, see the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases should be advised to self-quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person to a close contact (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (see Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the case fatality rate is approximately 7% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 29 April 2020, the national case fatality rate is 1.3% (6,738 confirmed cases/88 deaths).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China - indicating a probable zoonotic source. Human-to-human transmission is well established. As of 29 April 2020, 185 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 3,100,000 confirmed cases and 215,000 deaths (27). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (28), and declared a pandemic on 12 March 2020 (29).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are three main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.
4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases upon receipt of a notification/report.

As much information regarding the case's age, sex, place of residence, Indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Probable case

A person, who has not been tested, with fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat) **AND** who is a household contact (see Contact definition below) of a confirmed or probable case of COVID-19.

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical Criteria:

Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat).

Epidemiological criteria:

i. In the 14 days prior to illness onset:
- Close contact[2,3] (see Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers and crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[4]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (see definition above).

[3] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, see high risk settings.

[4] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat), where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Respiratory specimens should be collected in accordance with the appropriate guidelines, refer to Revised advice on non-inpatient care of people with suspected or confirmed COVID-19, including use of personal protective equipment (PPE): (https://www.health.gov.au/resources/publications/revised-advice-on-non-inpatient-care-of-people-with-suspected-or-confirmed-covid-19-including-use-of-personal-protective-equipment-ppe)

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. deep nasal and oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect a combined deep nasal and oropharyngeal swab, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g., fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.
Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.
- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, see aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not routinely available.

See Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (see Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. See Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures.** See Appendix B for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition, presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
  - given a surgical mask to put on if acute respiratory symptoms are present, AND
  - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
  - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
- If a patient with confirmed or probable COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” mask, follow respiratory hygiene, and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, see Appendix B.

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from necessary isolation restrictions, as well as when cases are clear to go into high risk settings. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Cases can go into a high risk setting if they meet the criteria in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first positive sample was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has **not** had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then they can be discharged to home isolation.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

   If the case, at or prior to discharge, has had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then the case can simultaneously be discharged and released from isolation.

4. Clinical and laboratory Criteria

   Cases returning to a high risk setting (such as working in a health care setting, living in a residential age care setting or being transferred to another ward in a hospital, see below for a list of high risk settings) can be released from isolation based on the clinical criteria above but must meet a higher standard and need additional assessment before going into the high risk setting.

Confirmed and probable cases who will be going into to a high-risk setting can go into that setting if they meet **all** the following criteria:

- be at least 10 days after the onset of the acute illness;
- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- PCR negative on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset [3,4]

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved. If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation.

[2] If a case who meets these criteria is swabbed, then the case be released from isolation regardless of the swab test result. The current evidence from the literature and Australian public health experience suggests that these people are unlikely to be infectious.

[3] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

[4] A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. In these circumstances, the decision around release to a high risk setting should be made on a case by case basis after discussion between the treating medical practitioner, the testing laboratory and public health. This may include laboratory interpretation of PCR cycle threshold (Ct) values and/or viral culture where available.

Routine PCR testing post-release from isolation is not recommended unless the person develops new clinical features consistent with COVID-19.

Persons who have been released from isolation should still adhere to social distancing measures, as the extent of acquired immunity is unknown.

If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (see suspect case definition) until 14 days after the last unprotected contact with the confirmed case and should vigilantly self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

High risk settings

In the context of the release from isolation criteria and some aspects of testing outlined in the case definition, high-risk settings are defined as:

- Aged care and other residential care facilities
- Healthcare settings*
- Military – group residential and other closed settings, such as Navy ships or living in accommodation
- Boarding schools and other group residential settings
- Educational settings where students are present
- Childcare centres
- Correctional facilities
- Detention centres
- Remote industrial sites with accommodation (e.g. mine sites)
- Aboriginal and Torres Strait Islander rural and remote communities, in consultation with the local PHU
- Settings where COVID-19 outbreaks are occurring, in consultation with the local PHU

* In relation to persons going into high risk settings, this includes: persons returning to work in healthcare settings; patients who will be remaining in hospital after release from isolation; and those regularly attending healthcare settings for any other purpose. Persons who need to present to an emergency department or general practice for medical consultations and treatment can do so without meeting these criteria, but should, where feasible, inform staff before arrival if they have recently been released from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B. Collection of upper respiratory specimens is not generally regarded as aerosol-generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (see Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (see Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (see definition of “close contacts” below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (see Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). See Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. See Special situations for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. See Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (.see Release from isolation).

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (see Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the infectious case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. This advice for all travellers to quarantine supersedes advice for returning travellers and people transiting through various destinations early in the outbreak.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, see Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Social distancing

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure social distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise social distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic household contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever OR acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (see section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. See Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, see the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.

- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

12. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

Any returned travellers should quarantine. Although a variety of quarantine arrangements have occurred, hotel-based quarantine is now the standard for returned international travellers, including for cruise-ship passengers and crew. It is important that appropriate PPE precautions are employed during any travel following disembarkation. Matters of quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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14. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Deep nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal: swab the right or left nostril by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril.
      To conserve swabs the same swab that has been used to sample the oropharynx should be utilised for deep nasal sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

3. Self-collected deep nasal and oropharyngeal swab using a single swab
    - Clear instructions should be provided to the patient. A self-collected combined deep nasal, oropharyngeal swab can be used that accesses the throat, and then a deep nasal swab inserted as far as comfortably possible into the depth of the nasal cavity. The process is then repeated in the second nostril. The swab is then placed into viral transport medium (VTM) or Liquid Amies.

- This broadens the use of swabs available, reduces infection risk to the health care worker providing the collection and also reduces the requirements for Personal Protective Equipment. PHLN has reviewed data that suggests this has been determined to be equivalent to combined nasal/nasopharyngeal and throat swabs in detecting coronavirus.
- To maximise control of the collection process, it is recommended that the self-collect process be undertaken with medical oversight.
- It is recommended that laboratories validate their ability to obtain equivalent viral loads and monitor positivity rates using these self-collection kits compared to other methods of collection.
- A self-collected sample should be clearly identified as such on the report.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing should be adequately trained and assessed in the appropriate use of PPE. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests.

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics.

See above for current case definitions and testing criteria.

NOTE: For clinical care of, or procedures on, patients who are NOT suspected of having COVID-19, i.e. business as usual, the usual infection prevention and control precautions, including PPE if required, should be observed, according to clinical circumstances.

Additional COVID-19 specific precautions are not required.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is of variable quality, sometimes contradictory and cannot, necessarily, be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** is apparently not uncommon but its incidence and role in transmission are unknown
  - It can occur at all ages
  - Fairly high rates of asymptomatic infection have been reported in the context of outbreaks in closed settings (e.g. cruise ship, aged care facility) or high community prevalence (e.g. China, New York)
- **Presymptomatic transmission** is well documented but the duration of infectivity before onset of symptoms is uncertain
- Relationships between **viral RNA load, infectivity and the stage and severity** of disease are uncertain
  - The presence on viral RNA does not necessarily indicate viable/infectious virus
  - Viral RNA load is variably reported as higher in the early than later stages of disease or increasing with late clinical deterioration
- There is varying evidence and much debate about the degree, if any, of **airborne vs droplet transmission** of COVID-19 but the relevance to the type of respiratory protection required in different settings is uncertain
  - There is strong evidence that COVID-19, like most respiratory viral infections, is predominantly transmitted by droplets
  - Clinical and epidemiological evidence suggest that airborne transmission is rare, but some aerosol-generating procedures (AGPs) can increase the risk

- Some fine particle (<5 micron) aerosols are produced by infected patients, but the quantity of virus in these particles is significantly less than that in large droplets
- The transmission dynamics of COVID-19 differ from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles and varicella

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a low percentage of positive results (currently 1.6%)
- More than 60% of total cases in Australia have been acquired overseas
- The number of cases and deaths from COVID-19 in Australia are in marked contrast to that in many parts of Europe, the United Kingdom and North America
- Since the introduction of travel restrictions and social distancing measures the daily number of new infections in Australia has fallen dramatically
- Community transmission is modest and limited to a few localised sites
- The case fatality rate in Australia, overall, is <1% and the median age of death is 78.5 years
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired

These data indicate that current containment measures in community and health care settings in Australia are effective if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[1].

AGPs performed on non-COVID-19 patients in operating theatre, emergency department, endoscopy suite etc.

Given the relatively low prevalence of COVID-19 in Australia, standard precautions, in addition to standard operating theatre attire or personal protective equipment appropriate for the procedure, are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, theatre gown, gloves, eye protection (and head covering only if required as regular theatre attire) should typically be worn. A P2 respirator is not necessary in this context.

See below for a list of AGPs.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not necessary, i.e., a surgical mask is sufficient.

General guidance on procedures performed on patients who are suspected or confirmed cases of COVID-19

Management of hospital patients in whom COVID-19 is NOT suspected

[1] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

PPE required for each patient encounter depends on the specific clinical circumstances, but similar principles apply to all.

Standard precautions are required for all patients regardless of known COVID-19 status. This includes hand hygiene (5 Moments) and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: stay at least 1.5 m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, tea breaks etc.

Management of patients with acute respiratory symptoms and/or suspected or proven COVID19

- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital AND
- Placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
- If an AGP is to be performed, the patient should be placed in a negative pressure room (or an isolation room with door closed if a negative pressure room is not available)

If transfer outside of the room is necessary, the patient should wear a surgical mask during transfer, follow respiratory hygiene, and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients in quarantine/isolation or under investigation for COVID-19 or with confirmed COVID-19
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used
- **Contact and airborne precautions** should be used when performing AGPs

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with clinical condition**
- **coughing generates droplets, predominantly**
- **surgical masks used by patient, if possible, and healthcare worker provide adequate protection.**

Contact and droplet precautions for use in routine care of patients with suspected or confirmed COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the mucosae of mouth, nose or eyes OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Use of personal protective equipment

The following PPE should be put on, in this order, before entering the patient's room:

- Long-sleeved fluid resistant gown
  - An apron is a suitable alternative in situations in which the risk of splash is low (e.g. specimens collection)
- Surgical mask (fluid resistant, level 2 or 3)
- Eye protection: face shield, wrap-around safety glasses or goggles
- Disposable non-sterile gloves when in contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Take care to avoid self-contamination, when removing PPE.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room. Do not touch the front of mask or eye covering; perform hand hygiene after each step

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions during aerosol-generating procedures in the care of patients with COVID-19

The only modification for **airborne precautions** is the use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask.

Principles of use of P2/N95 respirators in care of patients with suspected or confirmed COVID-19

- P2/N95 respirators should be used only in the context of patient care using airborne precautions
- Health care professionals who use P2/N95 respirators should be trained in their correct use

- Unless used correctly, protection against airborne pathogen transmission will be compromised
- The minimum standard of use of a P2/N95 respirator is **careful fit-checking** with each use
    - An airtight protective seal is difficult to achieve for people with facial hair that underlies the mask at its edges
        - Facial hair which impedes achieving a seal should be removed or an alternative respirator protection, e.g. powered air-purifying respirator (PAPR) - considered (see below)
    - If available, a range of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check)
        - If a suitable P2/N95 respirator cannot be found and alternative respirator - e.g. PAPR - should be considered
    - **Fit-testing** is recommended as the gold-standard (AS/NZS 1715:2009) for use of P2/N95 respirators, but it has not been widely applied in Australia
        - Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available
        - **NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check with each use**

Transmission-based precautions, as outlined—including appropriate use of P2/N95 respirators—will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.
Powered air-purifying respirators (PAPR)

- PAPRs are an alternative to P2/N95 respirators in selected circumstances:
    - A number of different types of relatively lightweight, comfortable PAPRs is available
    - PAPRs should only be used by healthcare professionals trained in their use, including safe removal with other PPE
    - PAPRs should be used according to the manufacturer's instructions
    - If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple procedures e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
    - PAPRs designed for use in other settings outside of health care are not recommended
    - Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

AGPs during the care of patients with suspected or confirmed COVID-19 are associated with a risk of transmission. The following *examples* are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:
- Insertion or removal of endotracheal tube
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit
- High frequency oscillatory ventilation (HFOV)
- Open oropharyngeal or tracheal suctioning
- Upper respiratory instrumentation or surgery
    - e.g. bronchoscopy, tracheotomy, ear nose throat surgery

- Surgical or post mortem procedures on respiratory tract involving high-speed devices
- Intercostal catheter insertion for relief of pneumothorax
- Thoracic surgery that involves entering the lung

Other procedures that can generate respiratory aerosols
- Manual or non-invasive ventilation (NIV);
    - Bi-level positive airway pressure ventilation (BiPAP)
    - Continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen (HFNO)
- Transoesophageal echocardiography

Cardiopulmonary resuscitation (CPR) is a special circumstance:
- Chest compression and defibrillation during resuscitation are not considered AGPs
- First responders can commence resuscitation without the need for airborne precautions while awaiting the arrival of clinicians to undertake airway manoeuvres

PPE in specific hospital settings

Intensive care unit (ICU)
- Contact and **droplet** precautions should be used for general care of COVID-19 patients in ICU e.g. a patient not requiring ventilation or AGPs
- Contact and **airborne** precautions should be used for care of COVID-19 patients in ICU requiring AGPs
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit
    - The use of P2/N95 respirators is recommended for AGPs, in the ICU. However, if a healthcare professional is required to remain in an ICU patient's room continuously for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility
    - ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators or PAPRs, preferably by an infection prevention and control professional or other suitably qualified personnel

Wards, including care of critically ill patients outside of the ICU setting
- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments
- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department except when an AGP (including passage of an endotracheal tube) is required
- Contact and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT suspected or confirmed cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves and eye protection.

The principles of routine infection prevention and control during elective surgery should be strictly adhered to, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff, caring patients with suspected or proven COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- Standard precautions apply to the care of all patients including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- Contact and **airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine, as a close contact. Precautions required to protect labour ward staff:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, remove gown and perform hand hygiene; remove mask and perform hand hygiene when leaving premises
    -

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website www.health.gov.au

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page at www.health.gov.au/state-territory-contacts

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.

2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.

1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases should be advised to self-quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person to a close contact (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, diarrhoea, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the case fatality rate is approximately 7% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 29 April 2020, the national case fatality rate is 1.3% (6,738 confirmed cases/88 deaths).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China - indicating a probable zoonotic source. Human-to-human transmission is well established. As of 29 April 2020, 185 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 3,100,000 confirmed cases and 215,000 deaths (27). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (28), and declared a pandemic on 12 March 2020 (29).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are three main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.
4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases upon receipt of a notification/report.

As much information regarding the case's age, sex, place of residence, Indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who tests positive to a validated specific SARS-CoV-2 nucleic acid test or has the virus identified by electron microscopy or viral culture.

Probable case

A person, who has not been tested, with fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat) **AND** who is a household contact (refer to Contact definition below) of a confirmed or probable case of COVID-19.

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical Criteria:

Fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Epidemiological criteria:

i. In the 14 days prior to illness onset:
- Close contact[3,4] (refer to Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers and crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[5]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[3] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[4] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, refer to high risk settings.

[5] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2], where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Respiratory specimens should be collected in accordance with the appropriate guidelines, refer to Revised advice on non-inpatient care of people with suspected or confirmed COVID-19, including use of personal protective equipment (PPE): (https://www.health.gov.au/resources/publications/revised-advice-on-non-inpatient-care-of-people-with-suspected-or-confirmed-covid-19-including-use-of-personal-protective-equipment-ppe)

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

When collecting respiratory specimens, transmission-based precautions should be observed whether or not respiratory symptoms are present.

For most patients with mild illness in the community, collection of upper respiratory specimens (i.e. deep nasal and oropharyngeal swabs) is a low risk procedure and can be performed using **contact and droplet precautions**:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield), and surgical mask.
- To collect a combined deep nasal and oropharyngeal swab, stand slightly to the side of the patient to avoid exposure to respiratory secretions, should the patient cough or sneeze.
- At completion of consultation, remove personal protective equipment (PPE) and perform hand hygiene, wipe any contacted/contaminated surfaces with detergent /disinfectant.
- Note that, for droplet precautions, the room does not need to be left empty after sample collection.

If the patient has severe symptoms suggestive of pneumonia, e.g., fever and breathing difficulty, or frequent, severe or productive coughing episodes then **contact and airborne precautions** should be observed.
Patients with these symptoms should be managed in hospital, and sample collection conducted in a negative pressure room, if available. If referral to hospital for specimen collection is not possible, specimens should be collected in a room from which air does not circulate to other areas. The door should be closed during specimens collection and the room left vacant for at least 30 minutes afterwards (cleaning can be performed during this time by a person wearing PPE).

The following precautions should be observed:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and a **P2/N95 respirator – which should be fit checked.**
- At completion of consultation, remove gown and gloves, perform hand hygiene, remove eye protection and P2/N95 respirator. Do not touch the front of any item of PPE during removal; perform hand hygiene.

- The room surfaces should be wiped clean with disinfectant wipes by a person wearing gloves, gown and surgical mask.

For further information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 is not routinely available.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures.** Refer to Appendix B for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition, presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
    - given a surgical mask to put on if acute respiratory symptoms are present, AND
    - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
    - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
- If a patient with confirmed or probable COVID-19 needs to be transferred out of their isolation room, the patient should wear a “surgical” mask, follow respiratory hygiene, and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from necessary isolation restrictions, as well as when cases are clear to go into high risk settings. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Cases can go into a high risk setting if they meet the criteria in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first positive sample was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has **not** had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then they can be discharged to home isolation.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

If the case, at or prior to discharge, has had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then the case can simultaneously be discharged and released from isolation.

4. Clinical and laboratory Criteria

Cases returning to a high risk setting (such as working in a health care setting, living in a residential age care setting or being transferred to another ward in a hospital, refer below for a list of high risk settings) can be released from isolation based on the clinical criteria above but must meet a higher standard and need additional assessment before going into the high risk setting.

Confirmed and probable cases who will be going into to a high-risk setting can go into that setting if they meet **all** the following criteria:

- be at least 10 days after the onset of the acute illness;
- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- PCR negative on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset [3,4]

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved. If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation.

[2] If a case who meets these criteria is swabbed, then the case be released from isolation regardless of the swab test result. The current evidence from the literature and Australian public health experience suggests that these people are unlikely to be infectious.

[3] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

[4] A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. In these circumstances, the decision around release to a high risk setting should be made on a case by case basis after discussion between the treating medical practitioner, the testing laboratory and public health. This may include laboratory interpretation of PCR cycle threshold (Ct) values and/or viral culture where available.

Routine PCR testing post-release from isolation is not recommended unless the person develops new clinical features consistent with COVID-19.

Persons who have been released from isolation should still adhere to social distancing measures, as the extent of acquired immunity is unknown.

If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to suspect case definition) until 14 days after the last unprotected contact with the confirmed case and should vigilantly self-monitor for symptoms clinically consistent with COVID-19.

If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

High risk settings

In the context of the release from isolation criteria and some aspects of testing outlined in the case definition, high-risk settings are defined as:

- Aged care and other residential care facilities
- Healthcare settings*
- Military – group residential and other closed settings, such as Navy ships or living in accommodation
- Boarding schools and other group residential settings
- Educational settings where students are present
- Childcare centres
- Correctional facilities
- Detention centres
- Remote industrial sites with accommodation (e.g. mine sites)
- Aboriginal and Torres Strait Islander rural and remote communities, in consultation with the local PHU
- Settings where COVID-19 outbreaks are occurring, in consultation with the local PHU

* In relation to persons going into high risk settings, this includes: persons returning to work in healthcare settings; patients who will be remaining in hospital after release from isolation; and those regularly attending healthcare settings for any other purpose. Persons who need to present to an emergency department or general practice for medical consultations and treatment can do so without meeting these criteria, but should, where feasible, inform staff before arrival if they have recently been released from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B. Collection of upper respiratory specimens is not generally regarded as aerosol-generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (refer to Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of “close contacts” below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (.refer to Release from isolation).

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the infectious case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. This advice for all travellers to quarantine supersedes advice for returning travellers and people transiting through various destinations early in the outbreak.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Social distancing

Social distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising social distancing, people can travel to work (including by public transport) and carry out normal duties. Social distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure social distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise social distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic household contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should undergo isolation and additionally be tested for SARS-CoV-2 if they meet the suspect case definition (fever OR acute respiratory illness).

Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain social distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.

- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

12. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

Any returned travellers should quarantine. Although a variety of quarantine arrangements have occurred, hotel-based quarantine is now the standard for returned international travellers, including for cruise-ship passengers and crew. It is important that appropriate PPE precautions are employed during any travel following disembarkation. Matters of quarantine should be addressed jurisdictionally.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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14. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Deep nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal: swab the right or left nostril by gently inserting the swab along the floor of the nasal cavity parallel to the palate until resistance is encountered, and rotate gently for 10-15 seconds; then withdraw and repeat the process in the other nostril.
      To conserve swabs the same swab that has been used to sample the oropharynx should be utilised for deep nasal sampling
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

3. Self-collected deep nasal and oropharyngeal swab using a single swab
    - Clear instructions should be provided to the patient. A self-collected combined deep nasal, oropharyngeal swab can be used that accesses the throat, and then a deep nasal swab inserted as far as comfortably possible into the depth of the nasal cavity. The process is then repeated in the second nostril. The swab is then placed into viral transport medium (VTM) or Liquid Amies.

- This broadens the use of swabs available, reduces infection risk to the health care worker providing the collection and also reduces the requirements for Personal Protective Equipment. PHLN has reviewed data that suggests this has been determined to be equivalent to combined nasal/nasopharyngeal and throat swabs in detecting coronavirus.
- To maximise control of the collection process, it is recommended that the self-collect process be undertaken with medical oversight.
- It is recommended that laboratories validate their ability to obtain equivalent viral loads and monitor positivity rates using these self-collection kits compared to other methods of collection.
- A self-collected sample should be clearly identified as such on the report.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and when serology testing becomes available tested in parallel with convalescent sera collected 3 or more weeks after acute infection. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing should be adequately trained and assessed in the appropriate use of PPE. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests.

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (refer below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics.

Refer above for current case definitions and testing criteria.

NOTE: For clinical care of, or procedures on, patients who are NOT suspected of having COVID-19, i.e. business as usual, the usual infection prevention and control precautions, including PPE if required, should be observed, according to clinical circumstances.

Additional COVID-19 specific precautions are not required.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is of variable quality, sometimes contradictory and cannot, necessarily, be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** is apparently not uncommon but its incidence and role in transmission are unknown
    - It can occur at all ages
    - Fairly high rates of asymptomatic infection have been reported in the context of outbreaks in closed settings (e.g. cruise ship, aged care facility) or high community prevalence (e.g. China, New York)
- **Presymptomatic transmission** is well documented but the duration of infectivity before onset of symptoms is uncertain
- Relationships between **viral RNA load, infectivity and the stage and severity** of disease are uncertain
    - The presence on viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load is variably reported as higher in the early than later stages of disease or increasing with late clinical deterioration
- There is varying evidence and much debate about the degree, if any, of **airborne vs droplet transmission** of COVID-19 but the relevance to the type of respiratory protection required in different settings is uncertain
    - There is strong evidence that COVID-19, like most respiratory viral infections, is predominantly transmitted by droplets
    - Clinical and epidemiological evidence suggest that airborne transmission is rare, but some aerosol-generating procedures (AGPs) can increase the risk

- Some fine particle (<5 micron) aerosols are produced by infected patients, but the quantity of virus in these particles is significantly less than that in large droplets
- The transmission dynamics of COVID-19 differ from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles and varicella

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a low percentage of positive results (currently 1.6%)
- More than 60% of total cases in Australia have been acquired overseas
- The number of cases and deaths from COVID-19 in Australia are in marked contrast to that in many parts of Europe, the United Kingdom and North America
- Since the introduction of travel restrictions and social distancing measures the daily number of new infections in Australia has fallen dramatically
- Community transmission is modest and limited to a few localised sites
- The case fatality rate in Australia, overall, is <1% and the median age of death is 78.5 years
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired

These data indicate that current containment measures in community and health care settings in Australia are effective if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[1].

AGPs performed on non-COVID-19 patients in operating theatre, emergency department, endoscopy suite etc.

Given the relatively low prevalence of COVID-19 in Australia, standard precautions, in addition to standard operating theatre attire or personal protective equipment appropriate for the procedure, are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, theatre gown, gloves, eye protection (and head covering only if required as regular theatre attire) should typically be worn. A P2 respirator is not necessary in this context.

Refer below for a list of AGPs.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not necessary, i.e., a surgical mask is sufficient.

General guidance on procedures performed on patients who are suspected or confirmed cases of COVID-19

Management of hospital patients in whom COVID-19 is NOT suspected

[1] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

PPE required for each patient encounter depends on the specific clinical circumstances, but similar principles apply to all.

Standard precautions are required for all patients regardless of known COVID-19 status. This includes hand hygiene (5 Moments) and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: stay at least 1.5 m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, tea breaks etc.

Management of patients with acute respiratory symptoms and/or suspected or proven COVID19

- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital AND
- Placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
- If an AGP is to be performed, the patient should be placed in a negative pressure room (or an isolation room with door closed if a negative pressure room is not available)

If transfer outside of the room is necessary, the patient should wear a surgical mask during transfer, follow respiratory hygiene, and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients in quarantine/isolation or under investigation for COVID-19 or with confirmed COVID-19
  - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used
- **Contact and airborne precautions** should be used when performing AGPs

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with clinical condition**
- **coughing generates droplets, predominantly**
- **surgical masks used by patient, if possible, and healthcare worker provide adequate protection.**

Contact and droplet precautions for use in routine care of patients with suspected or confirmed COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the mucosae of mouth, nose or eyes OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Use of personal protective equipment

The following PPE should be put on, in this order, before entering the patient's room:

- Long-sleeved fluid resistant gown
  - An apron is a suitable alternative in situations in which the risk of splash is low (e.g. specimens collection)
- Surgical mask (fluid resistant, level 2 or 3)
- Eye protection: face shield, wrap-around safety glasses or goggles
- Disposable non-sterile gloves when in contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Take care to avoid self-contamination, when removing PPE.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room. Do not touch the front of mask or eye covering; perform hand hygiene after each step

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions during aerosol-generating procedures in the care of patients with COVID-19

The only modification for **airborne precautions** is the use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask.

Principles of use of P2/N95 respirators in care of patients with suspected or confirmed COVID-19

- P2/N95 respirators should be used only in the context of patient care using airborne precautions
- Health care professionals who use P2/N95 respirators should be trained in their correct use

- Unless used correctly, protection against airborne pathogen transmission will be compromised
- The minimum standard of use of a P2/N95 respirator is **careful fit-checking** with each use
    - An airtight protective seal is difficult to achieve for people with facial hair that underlies the mask at its edges
        - Facial hair which impedes achieving a seal should be removed or an alternative respirator protection, e.g. powered air-purifying respirator (PAPR) - considered (refer below)
    - If available, a range of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check)
        - If a suitable P2/N95 respirator cannot be found and alternative respirator - e.g. PAPR - should be considered
    - **Fit-testing** is recommended as the gold-standard (AS/NZS 1715:2009) for use of P2/N95 respirators, but it has not been widely applied in Australia
        - Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available
        - **NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check with each use**

Transmission-based precautions, as outlined—including appropriate use of P2/N95 respirators—will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are an alternative to P2/N95 respirators in selected circumstances:
    - A number of different types of relatively lightweight, comfortable PAPRs is available
    - PAPRs should only be used by healthcare professionals trained in their use, including safe removal with other PPE
    - PAPRs should be used according to the manufacturer's instructions
    - If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple procedures e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
    - PAPRs designed for use in other settings outside of health care are not recommended
    - Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

AGPs during the care of patients with suspected or confirmed COVID-19 are associated with a risk of transmission. The following *examples* are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit
- High frequency oscillatory ventilation (HFOV)
- Open oropharyngeal or tracheal suctioning
- Upper respiratory instrumentation or surgery
    - e.g. bronchoscopy, tracheotomy, ear nose throat surgery

- Surgical or post mortem procedures on respiratory tract involving high-speed devices
- Intercostal catheter insertion for relief of pneumothorax
- Thoracic surgery that involves entering the lung

Other procedures that can generate respiratory aerosols
- Manual or non-invasive ventilation (NIV);
    - Bi-level positive airway pressure ventilation (BiPAP)
    - Continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen (HFNO)
- Transoesophageal echocardiography

Cardiopulmonary resuscitation (CPR) is a special circumstance:
- Chest compression and defibrillation during resuscitation are not considered AGPs
- First responders can commence resuscitation without the need for airborne precautions while awaiting the arrival of clinicians to undertake airway manoeuvres

PPE in specific hospital settings

Intensive care unit (ICU)
- Contact and **droplet** precautions should be used for general care of COVID-19 patients in ICU e.g. a patient not requiring ventilation or AGPs
- Contact and **airborne** precautions should be used for care of COVID-19 patients in ICU requiring AGPs
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit
    - The use of P2/N95 respirators is recommended for AGPs, in the ICU. However, if a healthcare professional is required to remain in an ICU patient's room continuously for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility
    - ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators or PAPRs, preferably by an infection prevention and control professional or other suitably qualified personnel

Wards, including care of critically ill patients outside of the ICU setting
- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments
- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department except when an AGP (including passage of an endotracheal tube) is required
- Contact and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT suspected or confirmed cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves and eye protection.

The principles of routine infection prevention and control during elective surgery should be strictly adhered to, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff, caring patients with suspected or proven COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- Standard precautions apply to the care of all patients including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- Contact and **airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine, as a close contact. Precautions required to protect labour ward staff:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, remove gown and perform hand hygiene; remove mask and perform hand hygiene when leaving premises
    -

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website www.health.gov.au

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page at www.health.gov.au/state-territory-contacts

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.

2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.

1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases should be advised to self-quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the case fatality rate is approximately 7% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 13 May 2020, the crude national case fatality rate is 1.4% (6,975 confirmed cases/98 deaths).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China - indicating a probable zoonotic source. Human-to-human transmission is well established. As of 13 May 2020, 218 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 4,260,000 confirmed cases and 290,000 deaths (27, 28). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (29), and declared a pandemic on 12 March 2020 (30).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who:

i. has not been tested, with fever (≥38°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat) **AND** is a household contact (refer to Contact definition below) of a confirmed or probable[3] case of COVID-19;

OR

ii. has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** is a close contact (refer to Contact definition below) of a confirmed or probable[3] case of COVID-19.

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical Criteria:

Fever (≥38°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4].

Epidemiological criteria:

i. In the 14 days prior to illness onset:
- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, refer to high risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥38°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2], where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria.

Respiratory specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of specimen collection from confirmed, probable, or suspect cases in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

For collection of specimens from asymptomatic members of the public being tested for surveillance purposes, standard precautions are required; additional PPE is not required. Perform hand hygiene between individual subjects.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.

- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures.** Refer to Appendix B for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from necessary isolation restrictions, as well as when cases are clear to go into high risk settings. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Cases can go into a high risk setting if they meet the criteria in point 4.

1. Confirmed cases who are asymptomatic.

    The case can be released from isolation if at least 10 days have passed since the first positive sample was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has **not** had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then they can be discharged to home isolation.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

   If the case, at or prior to discharge, has had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then the case can simultaneously be discharged and released from isolation.

4. Release into high risk setting.

   Cases returning to a high risk setting (such as working in a health care setting, living in a residential age care setting or being transferred to another ward in a hospital, see below for a list of high risk settings) can be released from isolation based on the clinical criteria above, but must meet a higher standard and need additional assessment before going into the high risk setting.

   Confirmed and probable cases who will be going into to a high-risk setting can go into that setting if they meet **all** the following criteria:

   - be at least 10 days after the onset of the acute illness;
   - the person has been afebrile for the previous 48 hours;
   - resolution of the acute illness for the previous 24 hours[1];
   - PCR negative on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset [3,4]

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved. If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that suggests these people are unlikely to be infectious. However, to go into a high risk setting they must meet the clinical and laboratory criteria as above in point 4.

[3] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

[4] A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. In these circumstances, the decision around release to a high risk setting should be made on a case by case basis after discussion between the treating medical practitioner, the testing laboratory and public health. This may include laboratory interpretation of PCR cycle threshold (Ct) values and/or viral culture where available.

Routine PCR testing post-release from isolation is not recommended unless the person develops new clinical features consistent with COVID-19.

Persons who have been released from isolation should still adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown.

If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to suspect case definition) until 14 days after the last unprotected contact with the confirmed case and should vigilantly self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

High risk settings

In the context of the release from isolation criteria and some aspects of testing outlined in the case definition, high-risk settings are defined as:

- Aged care and other residential care facilities
- Healthcare settings*
- Military – group residential and other closed settings, such as Navy ships or living in accommodation
- Boarding schools and other group residential settings
- Educational settings where students are present
- Childcare centres
- Correctional facilities
- Detention centres
- Remote industrial sites with accommodation (e.g. mine sites)
- Aboriginal and Torres Strait Islander rural and remote communities, in consultation with the local PHU
- Settings where COVID-19 outbreaks are occurring, in consultation with the local PHU

* In relation to persons going into high risk settings, this includes: persons returning to work in healthcare settings; patients who will be remaining in hospital after release from isolation; and those regularly attending healthcare settings for any other purpose. Persons who need to present to an emergency department or general practice for medical consultations and treatment can do so without meeting these criteria, but should, where feasible, inform staff before arrival if they have recently been released from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B. Collection of upper respiratory specimens is not generally regarded as aerosol-generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (refer to Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the infectious case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which may include mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

12. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers should quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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14. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Deep nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. To conserve swabs the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

3. Self-collected deep nasal and oropharyngeal swab using a single swab
    - Clear instructions should be provided to the patient. A self-collected combined deep nasal, oropharyngeal swab can be used that accesses the throat, and then a deep nasal swab inserted as far as comfortably possible into the depth of the nasal cavity. The process is then repeated in the second nostril. The swab is then placed into viral transport medium (VTM) or Liquid Amies.

- This broadens the use of swabs available, reduces infection risk to the health care worker providing the collection and also reduces the requirements for Personal Protective Equipment. PHLN has reviewed data that suggests this has been determined to be equivalent to combined nasal/nasopharyngeal and throat swabs in detecting coronavirus.
- To maximise control of the collection process, it is recommended that the self-collect process be undertaken with medical oversight.
- It is recommended that laboratories validate their ability to obtain equivalent viral loads and monitor positivity rates using these self-collection kits compared to other methods of collection.
- A self-collected sample should be clearly identified as such on the report.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the guidance from WHO on laboratory biosafety at (https://www.who.int/publications-detail/laboratory-biosafety-guidance-related-to-coronavirus-disease-2019-(covid-19) and notes the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing should be adequately trained and assessed in the appropriate use of PPE. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests.

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Network Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics.

Refer to above for current case definitions and testing criteria.

NOTE: For clinical care of, or procedures on, patients who are NOT suspected of having COVID-19, i.e. business as usual, the usual infection prevention and control precautions, including PPE if required, should be observed, according to clinical circumstances.

Additional COVID-19 specific precautions are not required.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is of variable quality, sometimes contradictory and cannot, necessarily, be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** is apparently not uncommon but its incidence and role in transmission are unknown
    - It can occur at all ages
    - Fairly high rates of asymptomatic infection have been reported in the context of outbreaks in closed settings (e.g. cruise ship, aged care facility) or high community prevalence (e.g. China, New York)
- **Presymptomatic transmission** is well documented but the duration of infectivity before onset of symptoms is uncertain
- Relationships between **viral RNA load, infectivity and the stage and severity** of disease are uncertain
    - The presence on viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load is variably reported as higher in the early than later stages of disease or increasing with late clinical deterioration
- There is varying evidence and much debate about the degree, if any, of **airborne vs droplet transmission** of COVID-19 but the relevance to the type of respiratory protection required in different settings is uncertain
    - There is strong evidence that COVID-19, like most respiratory viral infections, is predominantly transmitted by droplets
    - Clinical and epidemiological evidence suggest that airborne transmission is rare, but some aerosol-generating procedures (AGPs) can increase the risk
    - Some fine particle (<5 micron) aerosols are produced by infected patients, but the quantity of virus in these particles is significantly less than that in large droplets

- The transmission dynamics of COVID-19 differ from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles and varicella

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a low percentage of positive results (currently 1.6%)
- More than 60% of total cases in Australia have been acquired overseas
- The number of cases and deaths from COVID-19 in Australia are in marked contrast to that in many parts of Europe, the United Kingdom and North America
- Since the introduction of travel restrictions and physical distancing measures the daily number of new infections in Australia has fallen dramatically
- Community transmission is modest and limited to a few localised sites
- The case fatality rate in Australia, overall, is <1% and the median age of death is 78.5 years
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired

These data indicate that current containment measures in community and health care settings in Australia are effective if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[1].

AGPs performed on non-COVID-19 patients in operating theatre, emergency department, endoscopy suite etc.

Given the relatively low prevalence of COVID-19 in Australia, standard precautions, in addition to standard operating theatre attire or personal protective equipment appropriate for the procedure, are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, theatre gown, gloves, eye protection (and head covering only if required as regular theatre attire) should typically be worn. A P2 respirator is not necessary in this context.

See below for a list of AGPs.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not necessary, i.e., a surgical mask is sufficient.

General guidance on procedures performed on patients who are suspected or confirmed cases of COVID-19

Management of hospital patients in whom COVID-19 is NOT suspected

PPE required for each patient encounter depends on the specific clinical circumstances, but similar principles apply to all.

[1] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status. This includes hand hygiene (5 Moments) and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: stay at least 1.5 m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, tea breaks etc.

Management of patients with acute respiratory symptoms and/or suspected or proven COVID19

- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital AND
- Placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
- If an AGP is to be performed, the patient should be placed in a negative pressure room (or an isolation room with door closed if a negative pressure room is not available)

If transfer outside of the room is necessary, the patient should wear a surgical mask during transfer, follow respiratory hygiene, and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients in quarantine/isolation or under investigation for COVID-19 or with confirmed COVID-19
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used
- **Contact and airborne precautions** should be used when performing AGPs

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with clinical condition**
- **coughing generates droplets, predominantly**
- **surgical masks used by patient, if possible, and healthcare worker provide adequate protection.**

Contact and droplet precautions for use in routine care of patients with suspected or confirmed COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the mucosae of mouth, nose or eyes OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Use of personal protective equipment

The following PPE should be put on, in this order, before entering the patient's room:

- Long-sleeved fluid resistant gown
  - An apron is a suitable alternative in situations in which the risk of splash is low (e.g. specimens collection)
- Surgical mask (fluid resistant, level 2 or 3)
- Eye protection: face shield, wrap-around safety glasses or goggles
- Disposable non-sterile gloves when in contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Take care to avoid self-contamination, when removing PPE.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room. Do not touch the front of mask or eye covering; perform hand hygiene after each step

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions during aerosol-generating procedures in the care of patients with COVID-19

The only modification for **airborne precautions** is the use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask.

Principles of use of P2/N95 respirators in care of patients with suspected or confirmed COVID-19

- P2/N95 respirators should be used only in the context of patient care using airborne precautions
- Health care professionals who use P2/N95 respirators should be trained in their correct use

- Unless used correctly, protection against airborne pathogen transmission will be compromised
- The minimum standard of use of a P2/N95 respirator is **careful fit-checking** with each use
    - An airtight protective seal is difficult to achieve for people with facial hair that underlies the mask at its edges
        - Facial hair which impedes achieving a seal should be removed or an alternative respirator protection, e.g. powered air-purifying respirator (PAPR) - considered (see below)
    - If available, a range of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check)
        - If a suitable P2/N95 respirator cannot be found and alternative respirator - e.g. PAPR - should be considered
    - **Fit-testing** is recommended as the gold-standard (AS/NZS 1715:2009) for use of P2/N95 respirators, but it has not been widely applied in Australia
        - Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available
        - **NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check with each use**

Transmission-based precautions, as outlined—including appropriate use of P2/N95 respirators—will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are an alternative to P2/N95 respirators in selected circumstances:
    - A number of different types of relatively lightweight, comfortable PAPRs is available
    - PAPRs should only be used by healthcare professionals trained in their use, including safe removal with other PPE
    - PAPRs should be used according to the manufacturer's instructions
    - If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple procedures e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
    - PAPRs designed for use in other settings outside of health care are not recommended
    - Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

AGPs during the care of patients with suspected or confirmed COVID-19 are associated with a risk of transmission. The following *examples* are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit
- High frequency oscillatory ventilation (HFOV)
- Open oropharyngeal or tracheal suctioning
- Upper respiratory instrumentation or surgery
    - e.g. bronchoscopy, tracheotomy, ear nose throat surgery

- Surgical or post mortem procedures on respiratory tract involving high-speed devices
- Intercostal catheter insertion for relief of pneumothorax
- Thoracic surgery that involves entering the lung

Other procedures that can generate respiratory aerosols
- Manual or non-invasive ventilation (NIV);
    - Bi-level positive airway pressure ventilation (BiPAP)
    - Continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen (HFNO)
- Transoesophageal echocardiography

Cardiopulmonary resuscitation (CPR) is a special circumstance:
- Chest compression and defibrillation during resuscitation are not considered AGPs
- First responders can commence resuscitation without the need for airborne precautions while awaiting the arrival of clinicians to undertake airway manoeuvres

PPE in specific hospital settings

Intensive care unit (ICU)
- Contact and **droplet** precautions should be used for general care of COVID-19 patients in ICU e.g. a patient not requiring ventilation or AGPs
- Contact and **airborne** precautions should be used for care of COVID-19 patients in ICU requiring AGPs
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit
    - The use of P2/N95 respirators is recommended for AGPs, in the ICU. However, if a healthcare professional is required to remain in an ICU patient's room continuously for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility
    - ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators or PAPRs, preferably by an infection prevention and control professional or other suitably qualified personnel

Wards, including care of critically ill patients outside of the ICU setting
- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments
- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department except when an AGP (including passage of an endotracheal tube) is required
- Contact and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT suspected or confirmed cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves and eye protection.

The principles of routine infection prevention and control during elective surgery should be strictly adhered to, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff, caring patients with suspected or proven COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- Standard precautions apply to the care of all patients including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- Contact and **airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine, as a close contact. Precautions required to protect labour ward staff:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, remove gown and perform hand hygiene; remove mask and perform hand hygiene when leaving premises
    -

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website www.health.gov.au

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page at www.health.gov.au/state-territory-contacts

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. See Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
  - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
  - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
  - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all associated crew should be considered close contacts. In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (31-34).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (31). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (35).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.

2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.

1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases should be advised to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the case fatality rate is approximately 6.6% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 22 May 2020, the crude national case fatality rate is 1.4% (101 deaths/7,083 confirmed cases).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission is well established. As of 20 May 2020, 218 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 4,789,000 confirmed cases and 318,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (27), and declared a pandemic on 12 March 2020 (28).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who:

i. has not been tested, with fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **AND** is a household contact (refer to Contact definition below) of a confirmed or probable[3] case of COVID-19;

OR

ii. has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** is a close contact (refer to Contact definition below) of a confirmed or probable[3] case of COVID-19.

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical Criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4].

Epidemiological criteria:

i. In the 14 days prior to illness onset:
- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, refer to high risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2], where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions may test asymptomatic persons who are quarantined due to international (i.e. 'returned travellers') or interstate travel, with results to be received prior to the end of the quarantine period. As more information is becomes available, this recommendation may be strengthened. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of specimen collection from confirmed, probable, or suspect cases in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.

- If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
    - It must be changed if it becomes visibly contaminated.
    - It must be removed when leaving the immediate area to avoid contaminating other environments.

For collection of specimens from asymptomatic members of the public being tested for surveillance purposes, standard precautions are required; additional PPE is not required. Perform hand hygiene between individual subjects.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.

- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures.** Refer to Appendix B for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from necessary isolation restrictions, as well as when cases are clear to go into high risk settings. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Cases can go into a high risk setting if they meet the criteria in point 4.

1. Confirmed cases who are asymptomatic.

The case can be released from isolation if at least 10 days have passed since the first positive sample was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has **not** had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then they can be discharged to home isolation.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

   If the case, at or prior to discharge, has had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then the case can simultaneously be discharged and released from isolation.

4. Release into high risk setting.

   Cases returning to a high risk setting (such as working in a health care setting, living in a residential age care setting or being transferred to another ward in a hospital, see below for a list of high risk settings) can be released from isolation based on the clinical criteria above, but must meet a higher standard and need additional assessment before going into the high risk setting.

   Confirmed and probable cases who will be going into to a high-risk setting can go into that setting if they meet **all** the following criteria:

   - be at least 10 days after the onset of the acute illness;
   - the person has been afebrile for the previous 48 hours;
   - resolution of the acute illness for the previous 24 hours[1];
   - PCR negative on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset [3,4]

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved. If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that suggests these people are unlikely to be infectious. However, to go into a high risk setting they must meet the clinical and laboratory criteria as above in point 4.

[3] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

[4] A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. In these circumstances, the decision around release to a high risk setting should be made on a case by case basis after discussion between the treating medical practitioner, the testing laboratory and public health. This may include laboratory interpretation of PCR cycle threshold (Ct) values and/or viral culture where available.

Routine PCR testing post-release from isolation is not recommended unless the person develops new clinical features consistent with COVID-19.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Persons who have been released from isolation should still adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown.

If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to suspect case definition) until 14 days after the last unprotected contact with the confirmed case and should vigilantly self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

High risk settings

In the context of the release from isolation criteria and some aspects of testing outlined in the case definition, high-risk settings are defined as:

- Aged care and other residential care facilities
- Healthcare settings*
- Military – group residential and other closed settings, such as Navy ships or living in accommodation
- Boarding schools and other group residential settings
- Educational settings where students are present
- Childcare centres
- Correctional facilities
- Detention centres
- Remote industrial sites with accommodation (e.g. mine sites)
- Aboriginal and Torres Strait Islander rural and remote communities, in consultation with the local PHU
- Settings where COVID-19 outbreaks are occurring, in consultation with the local PHU

* In relation to persons going into high risk settings, this includes: persons returning to work in healthcare settings; patients who will be remaining in hospital after release from isolation; and those regularly attending healthcare settings for any other purpose. Persons who need to present to an emergency department or general practice for medical consultations and treatment can do so without meeting these criteria, but should, where feasible, inform staff before arrival if they have recently been released from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B. Collection of upper respiratory specimens is not generally regarded as aerosol-generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (refer to Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the infectious case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which may include mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions may test asymptomatic persons who are quarantined due to being a returned traveller or having undertaken interstate travel. Test results should be received prior to the end of the quarantine period. Testing may occur throughout the quarantine period. Early testing will allow earlier release from case isolation of detected cases than if tested late in the quarantine period. Specimens for quarantine release testing should be collected as close to the end of the quarantine period as possible, while still allowing enough time for results to be received by day 14 of the individual's quarantine period. This will usually mean collecting specimens on day 12, but may be earlier depending on a variety of factors including specimen transport and laboratory processing times. If a negative test result is received, the returned traveller may finish quarantine after the 14 day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

12. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers should quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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14. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Deep nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. To conserve swabs the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

3. Self-collected deep nasal and oropharyngeal swab using a single swab
    - Clear instructions should be provided to the patient. A self-collected combined deep nasal, oropharyngeal swab can be used that accesses the throat, and then a deep nasal swab inserted as far as comfortably possible into the depth of the nasal cavity. The process is then repeated in the second nostril. The swab is then placed into viral transport medium (VTM) or Liquid Amies.

- This broadens the use of swabs available, reduces infection risk to the health care worker providing the collection and also reduces the requirements for Personal Protective Equipment. PHLN has reviewed data that suggests this has been determined to be equivalent to combined nasal/nasopharyngeal and throat swabs in detecting coronavirus.
- To maximise control of the collection process, it is recommended that the self-collect process be undertaken with medical oversight.
- It is recommended that laboratories validate their ability to obtain equivalent viral loads and monitor positivity rates using these self-collection kits compared to other methods of collection.
- A self-collected sample should be clearly identified as such on the report.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the guidance from WHO on laboratory biosafety at (https://www.who.int/publications-detail/laboratory-biosafety-guidance-related-to-coronavirus-disease-2019-(covid-19) and notes the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing should be adequately trained and assessed in the appropriate use of PPE. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests.

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics.

Refer to above for current case definitions and testing criteria.

NOTE: For clinical care of, or procedures on, patients who are NOT suspected of having COVID-19, i.e. business as usual, the usual infection prevention and control precautions, including PPE if required, should be observed, according to clinical circumstances.

Additional COVID-19 specific precautions are not required.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is of variable quality, sometimes contradictory and cannot, necessarily, be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** is apparently not uncommon but its incidence and role in transmission are unknown
    - It can occur at all ages
    - Fairly high rates of asymptomatic infection have been reported in the context of outbreaks in closed settings (e.g. cruise ship, aged care facility) or high community prevalence (e.g. China, New York)
- **Presymptomatic transmission** is well documented but the duration of infectivity before onset of symptoms is uncertain
- Relationships between **viral RNA load, infectivity and the stage and severity** of disease are uncertain
    - The presence on viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load is variably reported as higher in the early than later stages of disease or increasing with late clinical deterioration
- There is varying evidence and much debate about the degree, if any, of **airborne vs droplet transmission** of COVID-19 but the relevance to the type of respiratory protection required in different settings is uncertain
    - There is strong evidence that COVID-19, like most respiratory viral infections, is predominantly transmitted by droplets
    - Clinical and epidemiological evidence suggest that airborne transmission is rare, but some aerosol-generating procedures (AGPs) can increase the risk
    - Some fine particle (<5 micron) aerosols are produced by infected patients, but the quantity of virus in these particles is significantly less than that in large droplets

- The transmission dynamics of COVID-19 differ from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles and varicella

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a low percentage of positive results (currently 1.6%)
- More than 60% of total cases in Australia have been acquired overseas
- The number of cases and deaths from COVID-19 in Australia are in marked contrast to that in many parts of Europe, the United Kingdom and North America
- Since the introduction of travel restrictions and physical distancing measures the daily number of new infections in Australia has fallen dramatically
- Community transmission is modest and limited to a few localised sites
- The case fatality rate in Australia, overall, is <1% and the median age of death is 78.5 years
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired

These data indicate that current containment measures in community and health care settings in Australia are effective if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[1].

AGPs performed on non-COVID-19 patients in operating theatre, emergency department, endoscopy suite etc.

Given the relatively low prevalence of COVID-19 in Australia, standard precautions, in addition to standard operating theatre attire or personal protective equipment appropriate for the procedure, are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, theatre gown, gloves, eye protection (and head covering only if required as regular theatre attire) should typically be worn. A P2 respirator is not necessary in this context.

See below for a list of AGPs.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not necessary, i.e., a surgical mask is sufficient.

General guidance on procedures performed on patients who are suspected or confirmed cases of COVID-19

Management of hospital patients in whom COVID-19 is NOT suspected

PPE required for each patient encounter depends on the specific clinical circumstances, but similar principles apply to all.

[1] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status. This includes hand hygiene (5 Moments) and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: stay at least 1.5 m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, tea breaks etc.

Management of patients with acute respiratory symptoms and/or suspected or proven COVID19

- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital AND
- Placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
- If an AGP is to be performed, the patient should be placed in a negative pressure room (or an isolation room with door closed if a negative pressure room is not available)

If transfer outside of the room is necessary, the patient should wear a surgical mask during transfer, follow respiratory hygiene, and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients in quarantine/isolation or under investigation for COVID-19 or with confirmed COVID-19
    - The use of nebulisers should be avoided and alternative medication administration devices (e.g. spacers) used
- **Contact and airborne precautions** should be used when performing AGPs

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with clinical condition**
- **coughing generates droplets, predominantly**
- **surgical masks used by patient, if possible, and healthcare worker provide adequate protection.**

Contact and droplet precautions for use in routine care of patients with suspected or confirmed COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the mucosae of mouth, nose or eyes OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Use of personal protective equipment

The following PPE should be put on, in this order, before entering the patient's room:

- Long-sleeved fluid resistant gown
  - An apron is a suitable alternative in situations in which the risk of splash is low (e.g. specimens collection)
- Surgical mask (fluid resistant, level 2 or 3)
- Eye protection: face shield, wrap-around safety glasses or goggles
- Disposable non-sterile gloves when in contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Take care to avoid self-contamination, when removing PPE.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room. Do not touch the front of mask or eye covering; perform hand hygiene after each step

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions during aerosol-generating procedures in the care of patients with COVID-19

The only modification for **airborne precautions** is the use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask.

Principles of use of P2/N95 respirators in care of patients with suspected or confirmed COVID-19

- P2/N95 respirators should be used only in the context of patient care using airborne precautions
- Health care professionals who use P2/N95 respirators should be trained in their correct use

- Unless used correctly, protection against airborne pathogen transmission will be compromised
- The minimum standard of use of a P2/N95 respirator is **careful fit-checking** with each use
    - An airtight protective seal is difficult to achieve for people with facial hair that underlies the mask at its edges
        - Facial hair which impedes achieving a seal should be removed or an alternative respirator protection, e.g. powered air-purifying respirator (PAPR) - considered (see below)
    - If available, a range of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check)
        - If a suitable P2/N95 respirator cannot be found and alternative respirator - e.g. PAPR - should be considered
    - **Fit-testing** is recommended as the gold-standard (AS/NZS 1715:2009) for use of P2/N95 respirators, but it has not been widely applied in Australia
        - Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available
        - **NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check with each use**

Transmission-based precautions, as outlined—including appropriate use of P2/N95 respirators—will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are an alternative to P2/N95 respirators in selected circumstances:
    - A number of different types of relatively lightweight, comfortable PAPRs is available
    - PAPRs should only be used by healthcare professionals trained in their use, including safe removal with other PPE
    - PAPRs should be used according to the manufacturer's instructions
    - If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple procedures e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
    - PAPRs designed for use in other settings outside of health care are not recommended
    - Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

AGPs during the care of patients with suspected or confirmed COVID-19 are associated with a risk of transmission. The following *examples* are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit
- High frequency oscillatory ventilation (HFOV)
- Open oropharyngeal or tracheal suctioning
- Upper respiratory instrumentation or surgery
    - e.g. bronchoscopy, tracheotomy, ear nose throat surgery

- Surgical or post mortem procedures on respiratory tract involving high-speed devices
- Intercostal catheter insertion for relief of pneumothorax
- Thoracic surgery that involves entering the lung

Other procedures that can generate respiratory aerosols
- Manual or non-invasive ventilation (NIV);
    - Bi-level positive airway pressure ventilation (BiPAP)
    - Continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen (HFNO)
- Transoesophageal echocardiography

Cardiopulmonary resuscitation (CPR) is a special circumstance:
- Chest compression and defibrillation during resuscitation are not considered AGPs
- First responders can commence resuscitation without the need for airborne precautions while awaiting the arrival of clinicians to undertake airway manoeuvres

PPE in specific hospital settings

Intensive care unit (ICU)
- Contact and **droplet** precautions should be used for general care of COVID-19 patients in ICU e.g. a patient not requiring ventilation or AGPs
- Contact and **airborne** precautions should be used for care of COVID-19 patients in ICU requiring AGPs
    - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit
    - The use of P2/N95 respirators is recommended for AGPs, in the ICU. However, if a healthcare professional is required to remain in an ICU patient's room continuously for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility
    - ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators or PAPRs, preferably by an infection prevention and control professional or other suitably qualified personnel

Wards, including care of critically ill patients outside of the ICU setting
- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments
- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department except when an AGP (including passage of an endotracheal tube) is required
- Contact and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT suspected or confirmed cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves and eye protection.

The principles of routine infection prevention and control during elective surgery should be strictly adhered to, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff, caring patients with suspected or proven COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- Standard precautions apply to the care of all patients including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- Contact and **airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine, as a close contact. Precautions required to protect labour ward staff:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, remove gown and perform hand hygiene; remove mask and perform hand hygiene when leaving premises
    -

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website www.health.gov.au

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page at www.health.gov.au/state-territory-contacts

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. See Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all associated crew should be considered close contacts. In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (29-32).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (29). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (33).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.

2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
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2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
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1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.

1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases should be advised to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the case fatality rate is approximately 6.4% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 28 May 2020, the crude national case fatality rate is 1.4% (103 deaths/7,139 confirmed cases).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 28 May 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 5,488,000 confirmed cases and 349,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (27), and declared a pandemic on 12 March 2020 (28).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical Criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4].

Epidemiological criteria:

i. In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, refer to high risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions may test asymptomatic persons who are quarantined due to international (i.e. 'returned travellers') or interstate travel, with results to be received prior to the end of the quarantine period. As more information is becomes available, this recommendation may be strengthened. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of specimen collection from confirmed, probable, or suspect cases in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

For collection of specimens from asymptomatic members of the public being tested for surveillance purposes, standard precautions are required; additional PPE is not required. Perform hand hygiene between individual subjects.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.

- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures.** Refer to Appendix B for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from necessary isolation restrictions, as well as when cases are clear to go into high risk settings. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Cases can go into a high risk setting if they meet the criteria in point 4.

1. Confirmed cases who are asymptomatic.

The case can be released from isolation if at least 10 days have passed since the first positive sample was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed or probable cases with more severe illness who have been discharged from hospital.

   If the case is ready clinically for hospital discharge, but has **not** had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then they can be discharged to home isolation.

The case can be released from home isolation if they meet all of the following criteria:

- at least 10 days have passed since hospital discharge; and
- there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2]

If the case, at or prior to discharge, has had two consecutive swabs taken at least 24 hours apart which are negative for SARS-CoV-2 by PCR, then the case can simultaneously be discharged and released from isolation.

4. Release into high risk setting.

Cases returning to a high risk setting (such as working in a health care setting, living in a residential age care setting or being transferred to another ward in a hospital, see below for a list of high risk settings) can be released from isolation based on the clinical criteria above, but must meet a higher standard and need additional assessment before going into the high risk setting.

Confirmed and probable cases who will be going into to a high-risk setting can go into that setting if they meet **all** the following criteria:

- be at least 10 days after the onset of the acute illness;
- the person has been afebrile for the previous 48 hours;
- resolution of the acute illness for the previous 24 hours[1];
- PCR negative on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset [3,4]

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved. If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that suggests these people are unlikely to be infectious. However, to go into a high risk setting they must meet the clinical and laboratory criteria as above in point 4.

[3] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

[4] A small proportion of people may have an illness that has completely resolved but their respiratory specimens remain persistently PCR positive. In these circumstances, the decision around release to a high risk setting should be made on a case by case basis after discussion between the treating medical practitioner, the testing laboratory and public health. This may include laboratory interpretation of PCR cycle threshold (Ct) values and/or viral culture where available.

Routine PCR testing post-release from isolation is not recommended unless the person develops new clinical features consistent with COVID-19.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) are met.

Persons who have been released from isolation should still adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown.

If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to suspect case definition) until 14 days after the last unprotected contact with the confirmed case and should vigilantly self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who have employment that may pose an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should continue to be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remained persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

High risk settings

In the context of the release from isolation criteria and some aspects of testing outlined in the case definition, high-risk settings are defined as:

- Aged care and other residential care facilities
- Healthcare settings*
- Military – group residential and other closed settings, such as Navy ships or living in accommodation
- Boarding schools and other group residential settings
- Educational settings where students are present
- Childcare centres
- Correctional facilities
- Detention centres

- Remote industrial sites with accommodation (e.g. mine sites)
- Aboriginal and Torres Strait Islander rural and remote communities, in consultation with the local PHU
- Settings where COVID-19 outbreaks are occurring, in consultation with the local PHU

* In relation to persons going into high risk settings, this includes: persons returning to work in healthcare settings; patients who will be remaining in hospital after release from isolation; and those regularly attending healthcare settings for any other purpose. Persons who need to present to an emergency department or general practice for medical consultations and treatment can do so without meeting these criteria, but should, where feasible, inform staff before arrival if they have recently been released from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B. Collection of upper respiratory specimens is not generally regarded as aerosol-generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (refer to Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.

- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected. Information on close contacts should be managed according to jurisdictional requirements.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the infectious case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which may include mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions may test asymptomatic persons who are quarantined due to being a returned traveller or having undertaken interstate travel. Test results should be received prior to the end of the quarantine period. Testing may occur throughout the quarantine period. Early testing will allow earlier release from case isolation of detected cases than if tested late in the quarantine period.

Specimens for quarantine release testing should be collected as close to the end of the quarantine period as possible, while still allowing enough time for results to be received by day 14 of the individual's quarantine period. This will usually mean collecting specimens on day 12 but may be earlier depending on a variety of factors including specimen transport and laboratory processing times. If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases. As more information is becomes available, this recommendation may be strengthened.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

Further details about the steps

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
  - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
  - Abattoirs.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

12. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions, informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place.

Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

13. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers should quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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15. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Deep nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. To conserve swabs the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

3. Self-collected deep nasal and oropharyngeal swab using a single swab
    - Clear instructions should be provided to the patient. A self-collected combined deep nasal, oropharyngeal swab can be used that accesses the throat, and then a deep nasal swab inserted as far as comfortably possible into the depth of the nasal cavity. The process is then repeated in the second nostril. The swab is then placed into viral transport medium (VTM) or Liquid Amies.

- This broadens the use of swabs available, reduces infection risk to the health care worker providing the collection and also reduces the requirements for Personal Protective Equipment. PHLN has reviewed data that suggests this has been determined to be equivalent to combined nasal/nasopharyngeal and throat swabs in detecting coronavirus.
- To maximise control of the collection process, it is recommended that the self-collect process be undertaken with medical oversight.
- It is recommended that laboratories validate their ability to obtain equivalent viral loads and monitor positivity rates using these self-collection kits compared to other methods of collection.
- A self-collected sample should be clearly identified as such on the report.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the guidance from WHO on laboratory biosafety at (https://www.who.int/publications-detail/laboratory-biosafety-guidance-related-to-coronavirus-disease-2019-(covid-19) and notes the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing should be adequately trained and assessed in the appropriate use of PPE. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests.

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence. **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours. The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease in later stages of disease. It has also been reported to increase with late deterioration.
- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.
    - **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**

    - large droplets (>10 micron) settle on surfaces close to the source patient
    - small particles (<10 micron) can remain suspended and travel long distances
  - Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
  - A**irborne transmission is believed, by most authorities, to be rare**.
    - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
    - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
    - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is 80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see page 6) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**
- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available
- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.
- A healthcare worker using contact and droplet precautions can safely commence chest compression or defibrillation of a patient with potential or confirmed COVID-19, until another clinician arrives, using airborne precautions, to manage the airway

Use of PPE in specific hospital settings

Intensive care unit (ICU)

Because most ICU patients require or are likely to require AGPs, P2/N95 respirators are often used routinely in ICUs.

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

However the risk of airborne transmission is minimal once the patient is intubated with a closed ventilator circuit. In this situation contact and droplet precautions are appropriate.

- Contact and **airborne** precautions should be used for care of COVID-19 patients in ICU requiring AGPs
    - The use of P2/N95 respirators is recommended for AGPs, in the ICU.
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)
    - AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- **Contact, droplet and airborne precautions** should be used in the later stages of labour if an AGP, such as intubation, ventilation or high flow nasal oxygen of mother or baby is required.
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.
    - **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website www.health.gov.au

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website www.health.gov.au/state-territory-contacts

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all associated crew should be considered close contacts. In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (29-32).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (29). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (33).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

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Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.

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2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.

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1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

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This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

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Contents

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1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases should be advised to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

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Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

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Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the case fatality rate is approximately 6% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 04 June 2020, the crude national case fatality rate is 1.4% (102 deaths/7,229 confirmed cases).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 03 June 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 6,287,000 confirmed cases and 379,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (27), and declared a pandemic on 12 March 2020 (28).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.

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4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

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Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical Criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4].

Epidemiological criteria:

i. In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

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[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, refer to high risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions may test asymptomatic persons who are quarantined due to international (i.e. 'returned travellers') or interstate travel, with results to be received prior to the end of the quarantine period. As more information is becomes available, this recommendation may be strengthened. For further information, see Contact management – returned travellers.

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All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of specimen collection from confirmed, probable, or suspect cases in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

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For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

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Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

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Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (see below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

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If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures.** Refer to Appendix B for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

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Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed or probable cases with more severe illness who have been in hospital.

   a. Confirmed and probable cases clinically ready for hospital discharge.

   If the case is ready clinically for hospital discharge then they can be discharged to isolation at home or another facility.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

   b. Confirmed and probable cases who will be remaining in hospital.

   A case that remains in hospital can be released from isolation if they meet all the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]; and
   - the case has had two consecutive respiratory specimens negative for SARS-CoV-2 by PCR taken at least 24 hours apart at least 7 days from symptom onset.

4. Significantly immunocompromised persons.

   In **addition** to meeting the appropriate criteria described in points 1, 2, or 3 above, persons who are significantly immunocompromised and are identified as confirmed or probable cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

   - PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

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Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation. If individuals with a persistent post-viral cough are persistently PCR positive, they can be managed as per note 4 below.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In lieu of PCR negative test results, results with high cycle threshold (Ct) values may also be used to inform release from isolation for significantly immunocompromised persons, after discussion between the treating medical practitioner, the testing laboratory and public health. Viral culture, where available, may also be considered.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19. If there is recrudescence of symptoms, the person should be tested for SARS-CoV-2 and other relevant medical conditions and managed accordingly.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (29, 30). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

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Persons who have been released from isolation should adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown. If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) until 14 days after the last unprotected contact with the confirmed case and should self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B. Collection of upper respiratory specimens is not generally regarded as aerosol-generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (refer to Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

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Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of “close contacts” below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

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For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

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All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the infectious case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which may include mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

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Jurisdictions may test asymptomatic persons who are quarantined due to being a returned traveller or having undertaken interstate travel. Test results should be received prior to the end of the quarantine period. Testing may occur throughout the quarantine period. Early testing will allow earlier release from case isolation of detected cases than if tested late in the quarantine period.

Specimens for quarantine release testing should be collected as close to the end of the quarantine period as possible, while still allowing enough time for results to be received by day 14 of the individual's quarantine period. This will usually mean collecting specimens on day 12 but may be earlier depending on a variety of factors including specimen transport and laboratory processing times. If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases. As more information is becomes available, this recommendation may be strengthened.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

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Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

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Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

Further details about the steps

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

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1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

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4. **Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.**

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

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8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

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Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

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Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

12. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

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Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

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- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

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Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

13. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

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Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers should quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

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Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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15. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

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Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Deep nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. To conserve swabs the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

3. Self-collected deep nasal and oropharyngeal swab using a single swab
    - Clear instructions should be provided to the patient. A self-collected combined deep nasal, oropharyngeal swab can be used that accesses the throat, and then a deep nasal swab inserted as far as comfortably possible into the depth of the nasal cavity. The process is then repeated in the second nostril. The swab is then placed into viral transport medium (VTM) or Liquid Amies.

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- This broadens the use of swabs available, reduces infection risk to the health care worker providing the collection and also reduces the requirements for Personal Protective Equipment. PHLN has reviewed data that suggests this has been determined to be equivalent to combined nasal/nasopharyngeal and throat swabs in detecting coronavirus.
- To maximise control of the collection process, it is recommended that the self-collect process be undertaken with medical oversight.
- It is recommended that laboratories validate their ability to obtain equivalent viral loads and monitor positivity rates using these self-collection kits compared to other methods of collection.
- A self-collected sample should be clearly identified as such on the report.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

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Point of care testing outside a PC2 facility

PHLN members considered the guidance from WHO on laboratory biosafety at (https://www.who.int/publications-detail/laboratory-biosafety-guidance-related-to-coronavirus-disease-2019-(covid-19) and notes the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing should be adequately trained and assessed in the appropriate use of PPE. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests.

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

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SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

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The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

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Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

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Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence. **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours. The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease in later stages of disease. It has also been reported to increase with late deterioration.
- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.

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- **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
  - large droplets (>10 micron) settle on surfaces close to the source patient
  - small particles (<10 micron) can remain suspended and travel long distances
- Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
- A**irborne transmission is believed, by most authorities, to be rare**.
  - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
  - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
  - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is 80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

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- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see page 6) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**

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- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

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Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available
- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended

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- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.
- A healthcare worker using contact and droplet precautions can safely commence chest compression or defibrillation of a patient with potential or confirmed COVID-19, until another clinician arrives, using airborne precautions, to manage the airway

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

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Use of PPE in specific hospital settings

Intensive care unit (ICU)

Because most ICU patients require or are likely to require AGPs, P2/N95 respirators are often used routinely in ICUs.
However the risk of airborne transmission is minimal once the patient is intubated with a closed ventilator circuit. In this situation contact and droplet precautions are appropriate.

- Contact and **airborne** precautions should be used for care of COVID-19 patients in ICU requiring AGPs
    - The use of P2/N95 respirators is recommended for AGPs, in the ICU.
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)
    - AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

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- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- **Contact, droplet and airborne precautions** should be used in the later stages of labour if an AGP, such as intubation, ventilation or high flow nasal oxygen of mother or baby is required.
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.
    - **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website www.health.gov.au

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website www.health.gov.au/state-territory-contacts

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

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Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

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Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

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3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all associated crew should be considered close contacts. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

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Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (31-34).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (31). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

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Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

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Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

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If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (35).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.

2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.

1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases should be advised to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the case fatality rate is approximately 6% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 04 June 2020, the crude national case fatality rate is 1.4% (102 deaths/7,229 confirmed cases).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 03 June 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 6,287,000 confirmed cases and 379,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (27), and declared a pandemic on 12 March 2020 (28).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

‘Human coronavirus with pandemic potential’ was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a “human biosecurity emergency” under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

i. In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, refer to high risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, loss of smell, loss of taste, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions may test asymptomatic persons who are quarantined due to international (i.e. 'returned travellers') or interstate travel, with results to be received prior to the end of the quarantine period. As more information is becomes available, this recommendation may be strengthened. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of specimen collection from confirmed, probable, or suspect cases in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (see below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures.** Refer to Appendix B for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed or probable cases with more severe illness who have been in hospital.

   a. Confirmed and probable cases clinically ready for hospital discharge.

   If the case is ready clinically for hospital discharge then they can be discharged to isolation at home or another facility.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

   b. Confirmed and probable cases who will be remaining in hospital.

   A case that remains in hospital can be released from isolation if they meet all the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]; and
   - the case has had two consecutive respiratory specimens negative for SARS-CoV-2 by PCR taken at least 24 hours apart at least 7 days from symptom onset.

4. Significantly immunocompromised persons.

   In **addition** to meeting the appropriate criteria described in points 1, 2, or 3 above, persons who are significantly immunocompromised and are identified as confirmed or probable cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:
   - PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset [5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation. If individuals with a persistent post-viral cough are persistently PCR positive, they can be managed as per note 4 below.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In lieu of PCR negative test results, results with high cycle threshold (Ct) values may also be used to inform release from isolation for significantly immunocompromised persons, after discussion between the treating medical practitioner, the testing laboratory and public health. Viral culture, where available, may also be considered.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19. If there is recrudescence of symptoms, the person should be tested for SARS-CoV-2 and other relevant medical conditions and managed accordingly.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (29, 30). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Persons who have been released from isolation should adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown. If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) until 14 days after the last unprotected contact with the confirmed case and should self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B. Collection of upper respiratory specimens is not generally regarded as aerosol-generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (refer to Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of “close contacts” below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the infectious case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which may include mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions may test asymptomatic persons who are quarantined due to being a returned traveller or having undertaken interstate travel. Test results should be received prior to the end of the quarantine period. Testing may occur throughout the quarantine period. Early testing will allow earlier release from case isolation of detected cases than if tested late in the quarantine period.

Specimens for quarantine release testing should be collected as close to the end of the quarantine period as possible, while still allowing enough time for results to be received by day 14 of the individual's quarantine period. This will usually mean collecting specimens on day 12 but may be earlier depending on a variety of factors including specimen transport and laboratory processing times. If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases. As more information is becomes available, this recommendation may be strengthened.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

Further details about the steps

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. **Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.**

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

12. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

13. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers should quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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15. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Deep nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. To conserve swabs the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

3. Self-collected deep nasal and oropharyngeal swab using a single swab
    - Clear instructions should be provided to the patient. A self-collected combined deep nasal, oropharyngeal swab can be used that accesses the throat, and then a deep nasal swab inserted as far as comfortably possible into the depth of the nasal cavity. The process is then repeated in the second nostril. The swab is then placed into viral transport medium (VTM) or Liquid Amies.

- This broadens the use of swabs available, reduces infection risk to the health care worker providing the collection and also reduces the requirements for Personal Protective Equipment. PHLN has reviewed data that suggests this has been determined to be equivalent to combined nasal/nasopharyngeal and throat swabs in detecting coronavirus.
- To maximise control of the collection process, it is recommended that the self-collect process be undertaken with medical oversight.
- It is recommended that laboratories validate their ability to obtain equivalent viral loads and monitor positivity rates using these self-collection kits compared to other methods of collection.
- A self-collected sample should be clearly identified as such on the report.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the guidance from WHO on laboratory biosafety at (https://www.who.int/publications-detail/laboratory-biosafety-guidance-related-to-coronavirus-disease-2019-(covid-19) and notes the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing should be adequately trained and assessed in the appropriate use of PPE. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests.

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory N*etwork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence. **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours. The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease in later stages of disease. It has also been reported to increase with late deterioration.
- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.

- **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
  - large droplets (>10 micron) settle on surfaces close to the source patient
  - small particles (<10 micron) can remain suspended and travel long distances
- Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
- A**irborne transmission is believed, by most authorities, to be rare**.
  - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
  - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
  - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is 80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see page 6) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**

- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available
- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended

- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.
- A healthcare worker using contact and droplet precautions can safely commence chest compression or defibrillation of a patient with potential or confirmed COVID-19, until another clinician arrives, using airborne precautions, to manage the airway

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

Because most ICU patients require or are likely to require AGPs, P2/N95 respirators are often used routinely in ICUs.
However the risk of airborne transmission is minimal once the patient is intubated with a closed ventilator circuit. In this situation contact and droplet precautions are appropriate.

- Contact and **airborne** precautions should be used for care of COVID-19 patients in ICU requiring AGPs
    - The use of P2/N95 respirators is recommended for AGPs, in the ICU.
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)
    - AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- **Contact, droplet and airborne precautions** should be used in the later stages of labour if an AGP, such as intubation, ventilation or high flow nasal oxygen of mother or baby is required.
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.
    - **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website www.health.gov.au

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website www.health.gov.au/state-territory-contacts

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all associated crew should be considered close contacts. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (31-34).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (31). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (35).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.

2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
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2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.

1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases should be advised to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the case fatality rate is approximately 5.3% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 22 June 2020, the crude national case fatality rate is 1.4% (102 deaths/7,474 confirmed cases).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 21 June 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 8,708,000 confirmed cases and 461,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (27), and declared a pandemic on 12 March 2020 (28).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used to determine the need for testing in hospitalised patients and patients who do not meet the clinical or epidemiological criteria.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

i. In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International or interstate travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

ii. Hospitalised patients, where no other clinical focus of infection or alternate explanation of the patient's illness is evident.

Footnotes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For a list of settings, refer to high risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions may test asymptomatic persons who are quarantined due to international (i.e. 'returned travellers') or interstate travel, with results to be received prior to the end of the quarantine period. As more information is becomes available, this recommendation may be strengthened. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of specimen collection from confirmed, probable, or suspect cases in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (see below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures.** Refer to Appendix B for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed or probable cases with more severe illness who have been in hospital.

   a. Confirmed and probable cases clinically ready for hospital discharge.

   If the case is ready clinically for hospital discharge then they can be discharged to isolation at home or another facility.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

   b. Confirmed and probable cases who will be remaining in hospital.

   A case that remains in hospital can be released from isolation if they meet all the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]; and
   - the case has had two consecutive respiratory specimens negative for SARS-CoV-2 by PCR taken at least 24 hours apart at least 7 days from symptom onset.

4. Significantly immunocompromised persons.

   In **addition** to meeting the appropriate criteria described in points 1, 2, or 3 above, persons who are significantly immunocompromised and are identified as confirmed or probable cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:
   - PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset [5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation. If individuals with a persistent post-viral cough are persistently PCR positive, they can be managed as per note 4 below.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In lieu of PCR negative test results, results with high cycle threshold (Ct) values may also be used to inform release from isolation for significantly immunocompromised persons, after discussion between the treating medical practitioner, the testing laboratory and public health. Viral culture, where available, may also be considered.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19. If there is recrudescence of symptoms, the person should be tested for SARS-CoV-2 and other relevant medical conditions and managed accordingly.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (29, 30). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Persons who have been released from isolation should adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown. If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) until 14 days after the last unprotected contact with the confirmed case and should self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B. Collection of upper respiratory specimens is not generally regarded as aerosol-generating, but airborne precautions should be used for collection of specimens from severely symptomatic patients (refer to Laboratory testing section).

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Airborne precautions should be used routinely for aerosol-generating procedures, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be advised to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts should be advised to self-quarantine at home for 14 days following the last contact with the infectious case, and to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which may include mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions may test asymptomatic persons who are quarantined due to being a returned traveller or having undertaken interstate travel. Test results should be received prior to the end of the quarantine period. Testing may occur throughout the quarantine period. Early testing will allow earlier release from case isolation of detected cases than if tested late in the quarantine period.

Specimens for quarantine release testing should be collected as close to the end of the quarantine period as possible, while still allowing enough time for results to be received by day 14 of the individual's quarantine period. This will usually mean collecting specimens on day 12 but may be earlier depending on a variety of factors including specimen transport and laboratory processing times. If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases. As more information is becomes available, this recommendation may be strengthened.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

Further details about the steps

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. **Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.**

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

12. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

13. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers should quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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15. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum (to be stored pending serology availability)

Upper respiratory tract samples

1. Deep nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. To conserve swabs the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium, which may be viral transport medium (VTM) or Liquid Amies.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

3. Self-collected deep nasal and oropharyngeal swab using a single swab
    - Clear instructions should be provided to the patient. A self-collected combined deep nasal, oropharyngeal swab can be used that accesses the throat, and then a deep nasal swab inserted as far as comfortably possible into the depth of the nasal cavity. The process is then repeated in the second nostril. The swab is then placed into viral transport medium (VTM) or Liquid Amies.

- This broadens the use of swabs available, reduces infection risk to the health care worker providing the collection and also reduces the requirements for Personal Protective Equipment. PHLN has reviewed data that suggests this has been determined to be equivalent to combined nasal/nasopharyngeal and throat swabs in detecting coronavirus.
- To maximise control of the collection process, it is recommended that the self-collect process be undertaken with medical oversight.
- It is recommended that laboratories validate their ability to obtain equivalent viral loads and monitor positivity rates using these self-collection kits compared to other methods of collection.
- A self-collected sample should be clearly identified as such on the report.

Lower respiratory tract samples

1. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

2. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the guidance from WHO on laboratory biosafety at (https://www.who.int/publications-detail/laboratory-biosafety-guidance-related-to-coronavirus-disease-2019-(covid-19) and notes the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing should be adequately trained and assessed in the appropriate use of PPE. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests.

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support, performed the first SARS-CoV-2 specific QAP, which closed on 11th March 2020, and involved 16 public and private laboratories in all Australian states and in New Zealand. This proficiency testing program (PTP) supplemented previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. The second PTP is planned for distribution to a wider range of laboratories, once testing has been extended to more laboratories.

Randox Laboratories and Quality Control for Molecular Diagnostics (QCMD) have announced a pilot EQA scheme for coronaviruses which will include inactivated SARS-CoV-2.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence. **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours. The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease in later stages of disease. It has also been reported to increase with late deterioration.
- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.

- **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
  - large droplets (>10 micron) settle on surfaces close to the source patient
  - small particles (<10 micron) can remain suspended and travel long distances
- Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
- A**irborne transmission is believed, by most authorities, to be rare**.
  - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
  - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
  - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is 80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see page 6) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**

- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available
- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended

- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.
- A healthcare worker using contact and droplet precautions can safely commence chest compression or defibrillation of a patient with potential or confirmed COVID-19, until another clinician arrives, using airborne precautions, to manage the airway

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

Because most ICU patients require or are likely to require AGPs, P2/N95 respirators are often used routinely in ICUs.
However the risk of airborne transmission is minimal once the patient is intubated with a closed ventilator circuit. In this situation contact and droplet precautions are appropriate.

- Contact and **airborne** precautions should be used for care of COVID-19 patients in ICU requiring AGPs
    - The use of P2/N95 respirators is recommended for AGPs, in the ICU.
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)
    - AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- **Contact, droplet and airborne precautions** should be used in the later stages of labour if an AGP, such as intubation, ventilation or high flow nasal oxygen of mother or baby is required.
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.
    - **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website www.health.gov.au

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website www.health.gov.au/state-territory-contacts

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all associated crew should be considered close contacts. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (31-34).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (31). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (35).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.

2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.

1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.

1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases are required to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 4.9% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 25 May 2020, the crude national CFR is 1.4%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 30 June 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 10,185,000 confirmed cases and 503,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (27), and declared a pandemic on 12 March 2020 (28).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

4. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases and COVID-19 deaths upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and COVID-19 deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

5. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

6. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For further information, refer to outbreak investigation and management in high-risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions may test asymptomatic persons who are quarantined due to international (i.e. 'returned travellers') or interstate travel, with results to be received prior to the end of the quarantine period. As more information is becomes available, this recommendation may be strengthened. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

7. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed, probable, or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Collection of upper respiratory samples from asymptomatic members of the public for surveillance purposes

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations but this is a guide:

- Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or feverishness?" and record the response.
- If the person has any symptoms, follow the infection prevention and control precautions above.
- If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in the current context of low or negligible community transmission of COVID-19.
- Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.

4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (see below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures** on patients with confirmed, probable or suspected COVID-19**.** Refer to Appendix B for further information.

Note that, consistent with Infection Control Expert Group guidance, previous advice on the use of airborne precautions for care of patients with severe cough has been withdrawn.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
  - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
    - given a surgical mask to put on if acute respiratory symptoms are present, AND
    - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
    - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
  - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed or probable cases with more severe illness who have been in hospital.

   a. Confirmed and probable cases clinically ready for hospital discharge.

If the case is ready clinically for hospital discharge then they can be discharged to isolation at home or another facility.

The case can be released from home isolation if they meet all of the following criteria:

- at least 10 days have passed since hospital discharge; and
- there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

b. Confirmed and probable cases who will be remaining in hospital.

A case that remains in hospital can be released from isolation if they meet all the following criteria:

- at least 10 days have passed since the onset of symptoms; and
- there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]; and
- the case has had two consecutive respiratory specimens negative for SARS-CoV-2 by PCR taken at least 24 hours apart at least 7 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3 above, persons who are significantly immunocompromised and are identified as confirmed or probable cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation. If individuals with a persistent post-viral cough are persistently PCR positive, they can be managed as per note 4 below.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In lieu of PCR negative test results, results with high cycle threshold (Ct) values may also be used to inform release from isolation for significantly immunocompromised persons, after discussion between the treating medical practitioner, the testing laboratory and public health. Viral culture, where available, may also be considered.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19. If there is recrudescence of symptoms, the person should be tested for SARS-CoV-2 and other relevant medical conditions and managed accordingly.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (29, 30). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Persons who have been released from isolation should adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown. If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) until 14 days after the last unprotected contact with the confirmed case and should self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or potential COVID-19 patients, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Note: for aerosol-generating procedures performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate. Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and are required to self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts are required to self-quarantine at home for 14 days following the last contact with the infectious case, and should be advised to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which may include mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions may test asymptomatic persons who are quarantined due to being a returned traveller or having undertaken interstate travel. Test results should be received prior to the end of the quarantine period. Testing may occur throughout the quarantine period. Early testing will allow earlier release from case isolation of detected cases than if tested late in the quarantine period.

Specimens for quarantine release testing should be collected as close to the end of the quarantine period as possible, while still allowing enough time for results to be received by day 14 of the individual's quarantine period. This will usually mean collecting specimens on day 12 but may be earlier depending on a variety of factors including specimen transport and laboratory processing times. If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases. As more information is becomes available, this recommendation may be strengthened.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

Further details about the steps

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs.

<u>Consider if a smaller defined setting is appropriate.</u>

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**<u>Whom to test</u>** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **<u>Actions</u>** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

12. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions, informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place.

Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

13. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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15. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Note: This appendix has been taken from the *PHLN guidance on laboratory testing for SARS-CoV-2*. This appendix will be updated as PHLN publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance, is available at: https://www.health.gov.au/resources/publications/phln-guidance-on-laboratory-testing-for-sars-cov-2-the-virus-that-causes-covid-19

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, and urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Collection of serum must be performed under transmission-based precautions if they are suspected COVID-19 cases or have proven COVID-19 infection and have not been released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum

Upper respiratory tract samples

1. Nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium. This may include viral (VTM) or universal transport medium (UTM), Liquid Amies or another validated transport medium. Whilst dry swabs are acceptable, swabs in transport medium are preferred.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. A self-collected oropharyngeal and bilateral deep nasal swab may in some circumstances be an appropriate method of specimen collection. However, where possible, health care worker supervision of the collection is encouraged.

    - PHLN has reviewed both domestic and international data that supports that this method of collection is equivalent to a medical practitioner conducting a combined nasal and throat swab in detecting coronavirus (31, 32).

    - This has the potential to reduce infection risk to the health care worker providing the collection and also reduces the requirements for PPE.

    - This method of collection should only be offered at the request of a medical practitioner or under public health direction as part of an agreed procedure with the testing laboratory.

        - The specimen collection method ‘SELF COLLECTION’ should be clearly documented on the request form by the requesting clinician and the patient should be instructed to document this also on the swab following collection.

    - Clear written instructions should be provided to the patient by the requesting medical practitioner or the pathology service providing the testing.

        - Provision of an accessible instructional video could support the written instructions.

        - If the requesting clinician is providing the swabs directly to the patient (rather than referring the patient to a specific pathology collection centre) then the clinician is responsible for ensuring that the receiving laboratory is able to process self-collect specimens.

    - The location at which the self-collect is conducted is at the discretion of the patient.

    - The self-collect consists of a combined oropharyngeal and bilateral deep nasal, that accesses the throat and then the nasal cavity and should be conducted by following the instructions above, noting that there may be variations in types of swabs available in different jurisdictions and by different pathology providers.

    - It is recommended that laboratories processing these self-collects consider:

        - Clearly identifying the specimen is a self-collected sample;

        - Validating their ability to obtain equivalent viral loads compared to other collection methods;

        - Monitoring positivity rates using these self-collection kits compared to other methods of collection; and

        - Adding a human DNA control to the COVID-19 PCR assay to confirm adequacy of sample collection.

3. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

Lower respiratory tract samples

1. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

2. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the WHO guidance Laboratory biosafety guidance related to coronavirus disease (COVID-19) and noted the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times; and
- Point of care (POC) or near-POC assays can be performed on a bench without employing a BSC, when the local risk assessment so dictates and proper precautions are in place.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing or near point of care testing should be adequately trained and assessed in the appropriate use of PPE and should not be put under increased pressure for test turnaround time. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests. Testing should not be conducted without a validated infectious waste process, including excess specimens in place (32).

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support offers a SARS-CoV-2 specific NAT QAP. This proficiency testing program (PTP) supplements previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. An RCPAQAP sponsored serology proficiency programme is in development with two programs to be offered by the end of 2020.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Note: This appendix is a copy of ICEG guidance and will be updated as ICEG publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance is available at: https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence.
- **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours.
- The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus

    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease in later stages of disease. It has also been reported to increase with late deterioration.
- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.
    - **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
        - large droplets (>10 micron) settle on surfaces close to the source patient
        - small particles (<10 micron) can remain suspended and travel long distances
    - Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
    - A**irborne transmission is believed, by most authorities, to be rare**.
        - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
        - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
        - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The low number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is ~80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see below) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**
- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available

- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

- Contact and droplet precautions are the minimum protection required in the context of CPR of a patient with suspected or confirmed COVID-19. A healthcare worker using contact and droplet precautions can safely commence defibrillation or chest compressions. However, some hospitals may recommend airborne precautions prior to commencement of chest compressions, if feasible.
- **Delay in the commencement of chest compressions should be avoided.**
- **A P2/N95 respirator should be used for active airway management procedures.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

- **Contact and droplet** precautions are minimum protection required for routine care of patients in ICU, who have suspected or confirmed COVID-19, who:
    - are not ventilated, or
    - are intubated with a closed ventilator circuit, from whom the risk of airborne transmission is minimal.
        - however, during routine care when the circuit is opened (e.g. to change a heat-moisture exchanger) a P2/N95 respirator should be used or
        - if risk assessment indicates that inadvertent disconnection of the ventilator circuit may occur, e.g. when the patient is moved, use of a P2/N95 respirator should be considered.
- Contact, droplet and **airborne** precautions, including a P2/N95 respirator or equivalent, should be used for care of COVID-19 patients in ICU requiring AGPs
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)

- AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
- the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

- **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (33-36).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (33). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (37).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.

2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.

1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.

1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines

Abbreviations and definitions

COVID-19: Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General’s remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)

SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as ‘novel coronavirus 2019 (2019-nCoV)’. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases are required to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 4.1% (25); however, this is likely an overestimate for the Australian health setting (26). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 25 May 2020, the crude national CFR is 1.4%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 24 July 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 15,012,000 confirmed cases and 619,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (27), and declared a pandemic on 12 March 2020 (28).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Routine prevention activities

Travel

Travel restrictions and quarantine requirements have been implemented to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE, avoid contact with sick people, and maintain good personal hygiene.

At present, all individuals returning to Australia from overseas must be quarantined for 14 days after returning to Australia.

Some jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology.

Personal hygiene

Individuals are advised to establish and maintain good hygiene practices. Individuals should:

- Practice good hand hygiene and respiratory hygiene
- Clean frequently touched surfaces regularly with appropriate detergents and disinfectants
- Stay home and not attend public places including work or school if they are unwell

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Physical distancing and gatherings

Physical distancing requirements may be enforced and restrictions have been implemented on public gatherings.

Jurisdictions have implemented restrictions and limitations on individual activities based on local epidemiology to support physical distancing.

All individuals are recommended to:

- Keep a minimum of 1.5m away from others wherever possible
- Avoid physically greeting other people

If individuals are attending public gatherings or venues they should comply with jurisdictional directions including limitations on the number of attendees.

4. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.

2. To identify, quarantine and provide information to contacts.

3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

5. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases and COVID-19 deaths upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and COVID-19 deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

6. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

7. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For further information, refer to outbreak investigation and management in high-risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any symptomatic persons should stay home until their symptoms have resolved. If symptoms have resolved, persons tested as part of enhanced testing do not need to continue to stay home until their test result is returned. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions may test asymptomatic persons who are quarantined due to international (i.e. 'returned travellers') or interstate travel, with results to be received prior to the end of the quarantine period. As more information is becomes available, this recommendation may be strengthened. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed, probable, or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*
(https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Collection of upper respiratory samples from asymptomatic members of the public for surveillance purposes

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations but this is a guide:

- Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or feverishness?" and record the response.
- If the person has any symptoms, follow the infection prevention and control precautions above.

- If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in the current context of low or negligible community transmission of COVID-19.
- Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2. In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. Public Health Units (PHUs) should consider this in low prevalence settings, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results. The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for URTI viral pathogens. If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.

2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)

- Previous infection with persistent shedding of viral RNA

3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be taken into account. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (see below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures** on patients with confirmed, probable or suspected COVID-19**.** Refer to Appendix B for further information.

Note that, consistent with Infection Control Expert Group guidance, previous advice on the use of airborne precautions for care of patients with severe cough has been withdrawn.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND

        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed or probable cases with more severe illness who have been in hospital.

   a. Confirmed and probable cases clinically ready for hospital discharge.

   If the case is ready clinically for hospital discharge then they can be discharged to isolation at home or another facility.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

   b. Confirmed and probable cases who will be remaining in hospital.

A case that remains in hospital can be released from isolation if they meet all the following criteria:

- at least 10 days have passed since the onset of symptoms; and
- there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]; and
- the case has had two consecutive respiratory specimens negative for SARS-CoV-2 by PCR taken at least 24 hours apart at least 7 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3 above, persons who are significantly immunocompromised and are identified as confirmed or probable cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation. If individuals with a persistent post-viral cough are persistently PCR positive, they can be managed as per note 4 below.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In lieu of PCR negative test results, results with high cycle threshold (Ct) values may also be used to inform release from isolation for significantly immunocompromised persons, after discussion between the treating medical practitioner, the testing laboratory and public health. Viral culture, where available, may also be considered.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19. If there is recrudescence of symptoms, the person should be tested for SARS-CoV-2 and other relevant medical conditions and managed accordingly.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (29, 30). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Persons who have been released from isolation should adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown. If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) until 14 days after the last unprotected contact with the confirmed case and should self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or potential COVID-19 patients, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Note: for aerosol-generating procedures performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate. Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and are required to self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts are required to self-quarantine at home for 14 days following the last contact with the infectious case, and should be advised to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which may include mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions may test asymptomatic persons who are quarantined due to being a returned traveller or having undertaken interstate travel. Test results should be received prior to the end of the quarantine period. Testing may occur throughout the quarantine period. Early testing will allow earlier release from case isolation of detected cases than if tested late in the quarantine period.

Specimens for quarantine release testing should be collected as close to the end of the quarantine period as possible, while still allowing enough time for results to be received by day 14 of the individual's quarantine period. This will usually mean collecting specimens on day 12 but may be earlier depending on a variety of factors including specimen transport and laboratory processing times. If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases. As more information is becomes available, this recommendation may be strengthened.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
  - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
  - Abattoirs.

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

5. Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. Collate information.

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

12. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

13. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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15. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Note: This appendix has been taken from the *PHLN guidance on laboratory testing for SARS-CoV-2*. This appendix will be updated as PHLN publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance, is available at: https://www.health.gov.au/resources/publications/phln-guidance-on-laboratory-testing-for-sars-cov-2-the-virus-that-causes-covid-19

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, and urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Collection of serum must be performed under transmission-based precautions if they are suspected COVID-19 cases or have proven COVID-19 infection and have not been released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum

Upper respiratory tract samples

1. Nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium. This may include viral (VTM) or universal transport medium (UTM), Liquid Amies or another validated transport medium. Whilst dry swabs are acceptable, swabs in transport medium are preferred.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. A self-collected oropharyngeal and bilateral deep nasal swab may in some circumstances be an appropriate method of specimen collection. However, where possible, health care worker supervision of the collection is encouraged.

    - PHLN has reviewed both domestic and international data that supports that this method of collection is equivalent to a medical practitioner conducting a combined nasal and throat swab in detecting coronavirus (31, 32).

    - This has the potential to reduce infection risk to the health care worker providing the collection and also reduces the requirements for PPE.

    - This method of collection should only be offered at the request of a medical practitioner or under public health direction as part of an agreed procedure with the testing laboratory.

        - The specimen collection method 'SELF COLLECTION' should be clearly documented on the request form by the requesting clinician and the patient should be instructed to document this also on the swab following collection.

    - Clear written instructions should be provided to the patient by the requesting medical practitioner or the pathology service providing the testing.

        - Provision of an accessible instructional video could support the written instructions.

        - If the requesting clinician is providing the swabs directly to the patient (rather than referring the patient to a specific pathology collection centre) then the clinician is responsible for ensuring that the receiving laboratory is able to process self-collect specimens.

    - The location at which the self-collect is conducted is at the discretion of the patient.

    - The self-collect consists of a combined oropharyngeal and bilateral deep nasal, that accesses the throat and then the nasal cavity and should be conducted by following the instructions above, noting that there may be variations in types of swabs available in different jurisdictions and by different pathology providers.

    - It is recommended that laboratories processing these self-collects consider:

        - Clearly identifying the specimen is a self-collected sample;

        - Validating their ability to obtain equivalent viral loads compared to other collection methods;

        - Monitoring positivity rates using these self-collection kits compared to other methods of collection; and

        - Adding a human DNA control to the COVID-19 PCR assay to confirm adequacy of sample collection.

3. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

Lower respiratory tract samples

1. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

2. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the WHO guidance Laboratory biosafety guidance related to coronavirus disease (COVID-19) and noted the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times; and

- Point of care (POC) or near-POC assays can be performed on a bench without employing a BSC, when the local risk assessment so dictates and proper precautions are in place.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing or near point of care testing should be adequately trained and assessed in the appropriate use of PPE and should not be put under increased pressure for test turnaround time. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests. Testing should not be conducted without a validated infectious waste process, including excess specimens in place (32).

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support offers a SARS-CoV-2 specific NAT QAP. This proficiency testing program (PTP) supplements previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. An RCPAQAP sponsored serology proficiency programme is in development with two programs to be offered by the end of 2020.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Note: This appendix is a copy of ICEG guidance and will be updated as ICEG publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance is available at: https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence.
- **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours.
- The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus

    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease in later stages of disease. It has also been reported to increase with late deterioration.
- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.
    - **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
        - large droplets (>10 micron) settle on surfaces close to the source patient
        - small particles (<10 micron) can remain suspended and travel long distances
    - Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
    - A**irborne transmission is believed, by most authorities, to be rare**.
        - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
        - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
        - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The low number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is ~80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see below) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**
- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available

- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

- Contact and droplet precautions are the minimum protection required in the context of CPR of a patient with suspected or confirmed COVID-19. A healthcare worker using contact and droplet precautions can safely commence defibrillation or chest compressions. However, some hospitals may recommend airborne precautions prior to commencement of chest compressions, if feasible.
- **Delay in the commencement of chest compressions should be avoided.**
- **A P2/N95 respirator should be used for active airway management procedures.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

- **Contact and droplet** precautions are minimum protection required for routine care of patients in ICU, who have suspected or confirmed COVID-19, who:
    - are not ventilated, or
    - are intubated with a closed ventilator circuit, from whom the risk of airborne transmission is minimal.
        - however, during routine care when the circuit is opened (e.g. to change a heat-moisture exchanger) a P2/N95 respirator should be used or
        - if risk assessment indicates that inadvertent disconnection of the ventilator circuit may occur, e.g. when the patient is moved, use of a P2/N95 respirator should be considered.
- Contact, droplet and **airborne** precautions, including a P2/N95 respirator or equivalent, should be used for care of COVID-19 patients in ICU requiring AGPs
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)

- AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
- the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

- **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (33-36).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (33). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (37).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.

2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.

1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.

1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General’s remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as ‘novel coronavirus 2019 (2019-nCoV)’. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases are required to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 4.0% (25); however, this is likely an overestimate for the Australian health setting. The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 25 May 2020, the crude national CFR is 1.4%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 30 July 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 16,558,000 confirmed cases and 656,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (26), and declared a pandemic on 12 March 2020 (27).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Routine prevention activities

Travel

Travel restrictions and quarantine requirements have been implemented to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE, avoid contact with sick people, and maintain good personal hygiene.

At present, all individuals returning to Australia from overseas must be quarantined for 14 days after returning to Australia.

Some jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology.

Personal hygiene

Individuals are advised to establish and maintain good hygiene practices. Individuals should:

- Practice good hand hygiene and respiratory hygiene
- Clean frequently touched surfaces regularly with appropriate detergents and disinfectants
- Stay home and not attend public places including work or school if they are unwell

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Physical distancing and gatherings

Physical distancing requirements may be enforced and restrictions have been implemented on public gatherings.

Jurisdictions have implemented restrictions and limitations on individual activities based on local epidemiology to support physical distancing.

All individuals are recommended to:

- Keep a minimum of 1.5m away from others wherever possible
- Avoid physically greeting other people

If individuals are attending public gatherings or venues they should comply with jurisdictional directions including limitations on the number of attendees.

4. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.

2. To identify, quarantine and provide information to contacts.

3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

5. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases and COVID-19 deaths upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and COVID-19 deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

6. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

7. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For further information, refer to outbreak investigation and management in high-risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any person with symptoms clinically compatible with COVID-19 who is tested should stay at home until a negative test is returned or symptoms have resolved, whichever is longer. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). They will do this on day 0–2 and then on day 10–12 of hotel quarantine, with results to be received prior to the end of the quarantine period. Exact arrangements will depend on states and territories. Jurisdictions may also test asymptomatic persons who are quarantined due to interstate travel. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed, probable, or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*
(https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Collection of upper respiratory samples from asymptomatic members of the public for surveillance purposes

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations but this is a guide:

- Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or feverishness?" and record the response.
- If the person has any symptoms, follow the infection prevention and control precautions above.

- If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in the current context of low or negligible community transmission of COVID-19.
- Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2. In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. Public Health Units (PHUs) should consider this in low prevalence settings, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results. The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for URTI viral pathogens. If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)

- Previous infection with persistent shedding of viral RNA

3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be taken into account. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

8. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (refer below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures** on patients with confirmed, probable or suspected COVID-19**.** Refer to Appendix B for further information.

Note that, consistent with Infection Control Expert Group guidance, previous advice on the use of airborne precautions for care of patients with severe cough has been withdrawn.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND

- placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
- directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).

- needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed or probable cases with more severe illness who have been in hospital.

   a. Confirmed and probable cases clinically ready for hospital discharge.

   If the case is ready clinically for hospital discharge then they can be discharged to isolation at home or another facility.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

   b. Confirmed and probable cases who will be remaining in hospital.

A case that remains in hospital can be released from isolation if they meet all the following criteria:

- at least 10 days have passed since the onset of symptoms; and
- there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]; and
- the case has had two consecutive respiratory specimens negative for SARS-CoV-2 by PCR taken at least 24 hours apart at least 7 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3 above, persons who are significantly immunocompromised and are identified as confirmed or probable cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation. If individuals with a persistent post-viral cough are persistently PCR positive, they can be managed as per note 4 below.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In lieu of PCR negative test results, results with high cycle threshold (Ct) values may also be used to inform release from isolation for significantly immunocompromised persons, after discussion between the treating medical practitioner, the testing laboratory and public health. Viral culture, where available, may also be considered.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19. If there is recrudescence of symptoms, the person should be tested for SARS-CoV-2 and other relevant medical conditions and managed accordingly.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (28, 29). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Persons who have been released from isolation should adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown. If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) until 14 days after the last unprotected contact with the confirmed case and should self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or potential COVID-19 patients, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Note: for aerosol-generating procedures performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate. Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

9. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

10. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and are required to self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.
- At the discretion of PHU, the definition of a close contact may be expanded to include a broader range of contacts. This may be relevant where there has been evidence of transmission in a particular circumstance or setting.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts are required to self-quarantine at home for 14 days following the last contact with the infectious case, and should be advised to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

11. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
  - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
  - Abattoirs.

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**<u>Whom to test</u>** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **<u>Actions</u>** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

12. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions, informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place.

Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

13. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

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15. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Note: This appendix has been taken from the *PHLN guidance on laboratory testing for SARS-CoV-2*. This appendix will be updated as PHLN publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance, is available at: https://www.health.gov.au/resources/publications/phln-guidance-on-laboratory-testing-for-sars-cov-2-the-virus-that-causes-covid-19

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, and urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Collection of serum must be performed under transmission-based precautions if they are suspected COVID-19 cases or have proven COVID-19 infection and have not been released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum

Upper respiratory tract samples

1. Nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium. This may include viral (VTM) or universal transport medium (UTM), Liquid Amies or another validated transport medium. Whilst dry swabs are acceptable, swabs in transport medium are preferred.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. A self-collected oropharyngeal and bilateral deep nasal swab may in some circumstances be an appropriate method of specimen collection. However, where possible, health care worker supervision of the collection is encouraged.

    - PHLN has reviewed both domestic and international data that supports that this method of collection is equivalent to a medical practitioner conducting a combined nasal and throat swab in detecting coronavirus (30, 31).

    - This has the potential to reduce infection risk to the health care worker providing the collection and also reduces the requirements for PPE.

    - This method of collection should only be offered at the request of a medical practitioner or under public health direction as part of an agreed procedure with the testing laboratory.

        - The specimen collection method 'SELF COLLECTION' should be clearly documented on the request form by the requesting clinician and the patient should be instructed to document this also on the swab following collection.

    - Clear written instructions should be provided to the patient by the requesting medical practitioner or the pathology service providing the testing.

        - Provision of an accessible instructional video could support the written instructions.

        - If the requesting clinician is providing the swabs directly to the patient (rather than referring the patient to a specific pathology collection centre) then the clinician is responsible for ensuring that the receiving laboratory is able to process self-collect specimens.

    - The location at which the self-collect is conducted is at the discretion of the patient.

    - The self-collect consists of a combined oropharyngeal and bilateral deep nasal, that accesses the throat and then the nasal cavity and should be conducted by following the instructions above, noting that there may be variations in types of swabs available in different jurisdictions and by different pathology providers.

    - It is recommended that laboratories processing these self-collects consider:

        - Clearly identifying the specimen is a self-collected sample;

        - Validating their ability to obtain equivalent viral loads compared to other collection methods;

        - Monitoring positivity rates using these self-collection kits compared to other methods of collection; and

        - Adding a human DNA control to the COVID-19 PCR assay to confirm adequacy of sample collection.

3. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

Lower respiratory tract samples

1. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

2. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the WHO guidance Laboratory biosafety guidance related to coronavirus disease (COVID-19) and noted the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times; and

- Point of care (POC) or near-POC assays can be performed on a bench without employing a BSC, when the local risk assessment so dictates and proper precautions are in place.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing or near point of care testing should be adequately trained and assessed in the appropriate use of PPE and should not be put under increased pressure for test turnaround time. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests. Testing should not be conducted without a validated infectious waste process, including excess specimens in place (31).

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support offers a SARS-CoV-2 specific NAT QAP. This proficiency testing program (PTP) supplements previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. An RCPAQAP sponsored serology proficiency programme is in development with two programs to be offered by the end of 2020.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Note: This appendix is a copy of ICEG guidance and will be updated as ICEG publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance is available at: https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence.
- **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours.
- The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus

    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease in later stages of disease. It has also been reported to increase with late deterioration.
- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.
    - **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
        - large droplets (>10 micron) settle on surfaces close to the source patient
        - small particles (<10 micron) can remain suspended and travel long distances
    - Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
    - A**irborne transmission is believed, by most authorities, to be rare**.
        - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
        - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
        - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The low number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is ~80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see below) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**
- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available

- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

- Contact and droplet precautions are the minimum protection required in the context of CPR of a patient with suspected or confirmed COVID-19. A healthcare worker using contact and droplet precautions can safely commence defibrillation or chest compressions. However, some hospitals may recommend airborne precautions prior to commencement of chest compressions, if feasible.
- **Delay in the commencement of chest compressions should be avoided.**
- **A P2/N95 respirator should be used for active airway management procedures.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

- **Contact and droplet** precautions are minimum protection required for routine care of patients in ICU, who have suspected or confirmed COVID-19, who:
    - are not ventilated, or
    - are intubated with a closed ventilator circuit, from whom the risk of airborne transmission is minimal.
        - however, during routine care when the circuit is opened (e.g. to change a heat-moisture exchanger) a P2/N95 respirator should be used or
        - if risk assessment indicates that inadvertent disconnection of the ventilator circuit may occur, e.g. when the patient is moved, use of a P2/N95 respirator should be considered.
- Contact, droplet and **airborne** precautions, including a P2/N95 respirator or equivalent, should be used for care of COVID-19 patients in ICU requiring AGPs
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)

- AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
- the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

- **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (32-35).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (32). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (36).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.

3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.

2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.

1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines

Abbreviations and definitions

COVID-19: Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)

SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases are required to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

Human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 3.7% (25); however, this is likely an overestimate for the Australian health setting. The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 25 May 2020, the crude national CFR is 1.4%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 11 August 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 19,936,000 confirmed cases and 732,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (26), and declared a pandemic on 12 March 2020 (27).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Routine prevention activities

Travel

Travel restrictions and quarantine requirements have been implemented to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE, avoid contact with sick people, and maintain good personal hygiene.

At present, all individuals returning to Australia from overseas must be quarantined for 14 days after returning to Australia.

Some jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology.

Personal hygiene

Individuals are advised to establish and maintain good hygiene practices. Individuals should:

- Practice good hand hygiene and respiratory hygiene
- Clean frequently touched surfaces regularly with appropriate detergents and disinfectants
- Stay home and not attend public places including work or school if they are unwell

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Physical distancing and gatherings

Physical distancing requirements may be enforced and restrictions have been implemented on public gatherings.

Jurisdictions have implemented restrictions and limitations on individual activities based on local epidemiology to support physical distancing.

All individuals are recommended to:

- Keep a minimum of 1.5m away from others wherever possible
- Avoid physically greeting other people

If individuals are attending public gatherings or venues they should comply with jurisdictional directions including limitations on the number of attendees.

4. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.

2. To identify, quarantine and provide information to contacts.

3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

5. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases and COVID-19 deaths upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and COVID-19 deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

6. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

7. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For further information, refer to outbreak investigation and management in high-risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any person with symptoms clinically compatible with COVID-19 who is tested should stay at home until a negative test is returned or symptoms have resolved, whichever is longer. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Asymptomatic persons tested as a part of screening at workplaces or borders are not required to stay home until a negative test result is returned, unless advised by PHU or relevant jurisdictional authorities. Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). They will do this on day 0–2 and then on day 10–12 of hotel quarantine, with results to be received prior to the end of the quarantine period. Exact arrangements will depend on states and territories. Jurisdictions may also test asymptomatic persons who are quarantined due to interstate travel. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

8. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed, probable, or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*
(https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Collection of upper respiratory samples from asymptomatic members of the public for surveillance purposes

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations but this is a guide:

- Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or feverishness?" and record the response.
- If the person has any symptoms, follow the infection prevention and control precautions above.

- If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in the current context of low or negligible community transmission of COVID-19.
- Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2. In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. Public Health Units (PHUs) should consider this in low prevalence settings, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results. The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for URTI viral pathogens. If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)

- Previous infection with persistent shedding of viral RNA

3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be taken into account. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

9. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (refer below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures** on patients with confirmed, probable or suspected COVID-19**.** Refer to Appendix B for further information.

Note that, consistent with Infection Control Expert Group guidance, previous advice on the use of airborne precautions for care of patients with severe cough has been withdrawn.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND

        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness who did not require hospitalisation.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed or probable cases with more severe illness who have been in hospital.

   a. Confirmed and probable cases clinically ready for hospital discharge.

   If the case is ready clinically for hospital discharge then they can be discharged to isolation at home or another facility.

   The case can be released from home isolation if they meet all of the following criteria:

   - at least 10 days have passed since hospital discharge; and
   - there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]

   b. Confirmed and probable cases who will be remaining in hospital.

A case that remains in hospital can be released from isolation if they meet all the following criteria:

- at least 10 days have passed since the onset of symptoms; and
- there has been resolution of all symptoms of the acute illness for the previous 72 hours[1,2,3]; and
- the case has had two consecutive respiratory specimens negative for SARS-CoV-2 by PCR taken at least 24 hours apart at least 7 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3 above, persons who are significantly immunocompromised and are identified as confirmed or probable cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation. If individuals with a persistent post-viral cough are persistently PCR positive, they can be managed as per note 4 below.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In lieu of PCR negative test results, results with high cycle threshold (Ct) values may also be used to inform release from isolation for significantly immunocompromised persons, after discussion between the treating medical practitioner, the testing laboratory and public health. Viral culture, where available, may also be considered.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19. If there is recrudescence of symptoms, the person should be tested for SARS-CoV-2 and other relevant medical conditions and managed accordingly.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (28, 29). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Persons who have been released from isolation should adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown. If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) until 14 days after the last unprotected contact with the confirmed case and should self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or potential COVID-19 patients, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Note: for aerosol-generating procedures performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate. Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

10. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

11. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and are required to self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.
- At the discretion of PHU, the definition of a close contact may be expanded to include a broader range of contacts. This may be relevant where there has been evidence of transmission in a particular circumstance or setting.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts are required to self-quarantine at home for 14 days following the last contact with the infectious case, and should be advised to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

12. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
  - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
  - Abattoirs.

<u>Consider if a smaller defined setting is appropriate.</u>

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**<u>Whom to test</u>** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **<u>Actions</u>** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

13. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA Interim National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-interim-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions, informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place.

Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

14. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

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16. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Note: This appendix has been taken from the *PHLN guidance on laboratory testing for SARS-CoV-2*. This appendix will be updated as PHLN publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance, is available at: https://www.health.gov.au/resources/publications/phln-guidance-on-laboratory-testing-for-sars-cov-2-the-virus-that-causes-covid-19

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, and urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Collection of serum must be performed under transmission-based precautions if they are suspected COVID-19 cases or have proven COVID-19 infection and have not been released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum

Upper respiratory tract samples

1. Nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium. This may include viral (VTM) or universal transport medium (UTM), Liquid Amies or another validated transport medium. Whilst dry swabs are acceptable, swabs in transport medium are preferred.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. A self-collected oropharyngeal and bilateral deep nasal swab may in some circumstances be an appropriate method of specimen collection. However, where possible, health care worker supervision of the collection is encouraged.

    - PHLN has reviewed both domestic and international data that supports that this method of collection is equivalent to a medical practitioner conducting a combined nasal and throat swab in detecting coronavirus (30, 31).

    - This has the potential to reduce infection risk to the health care worker providing the collection and also reduces the requirements for PPE.

    - This method of collection should only be offered at the request of a medical practitioner or under public health direction as part of an agreed procedure with the testing laboratory.

        - The specimen collection method ‘SELF COLLECTION’ should be clearly documented on the request form by the requesting clinician and the patient should be instructed to document this also on the swab following collection.

    - Clear written instructions should be provided to the patient by the requesting medical practitioner or the pathology service providing the testing.

        - Provision of an accessible instructional video could support the written instructions.

        - If the requesting clinician is providing the swabs directly to the patient (rather than referring the patient to a specific pathology collection centre) then the clinician is responsible for ensuring that the receiving laboratory is able to process self-collect specimens.

    - The location at which the self-collect is conducted is at the discretion of the patient.

    - The self-collect consists of a combined oropharyngeal and bilateral deep nasal, that accesses the throat and then the nasal cavity and should be conducted by following the instructions above, noting that there may be variations in types of swabs available in different jurisdictions and by different pathology providers.

    - It is recommended that laboratories processing these self-collects consider:

        - Clearly identifying the specimen is a self-collected sample;

        - Validating their ability to obtain equivalent viral loads compared to other collection methods;

        - Monitoring positivity rates using these self-collection kits compared to other methods of collection; and

        - Adding a human DNA control to the COVID-19 PCR assay to confirm adequacy of sample collection.

3. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

Lower respiratory tract samples

1. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

2. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the WHO guidance Laboratory biosafety guidance related to coronavirus disease (COVID-19) and noted the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times; and

- Point of care (POC) or near-POC assays can be performed on a bench without employing a BSC, when the local risk assessment so dictates and proper precautions are in place.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing or near point of care testing should be adequately trained and assessed in the appropriate use of PPE and should not be put under increased pressure for test turnaround time. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests. Testing should not be conducted without a validated infectious waste process, including excess specimens in place (31).

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support offers a SARS-CoV-2 specific NAT QAP. This proficiency testing program (PTP) supplements previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. An RCPAQAP sponsored serology proficiency programme is in development with two programs to be offered by the end of 2020.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Note: This appendix is a copy of ICEG guidance and will be updated as ICEG publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance is available at: https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence.
- **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours.
- The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease

in later stages of disease. It has also been reported to increase with late deterioration.

- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.
    - **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
        - large droplets (>10 micron) settle on surfaces close to the source patient
        - small particles (<10 micron) can remain suspended and travel long distances
    - Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
    - A**irborne transmission is believed, by most authorities, to be rare**.
        - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
        - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
        - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The low number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is ~80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see below) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**
- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available

- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

- Contact and droplet precautions are the minimum protection required in the context of CPR of a patient with suspected or confirmed COVID-19. A healthcare worker using contact and droplet precautions can safely commence defibrillation or chest compressions. However, some hospitals may recommend airborne precautions prior to commencement of chest compressions, if feasible.
- **Delay in the commencement of chest compressions should be avoided.**
- **A P2/N95 respirator should be used for active airway management procedures.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

- **Contact and droplet** precautions are minimum protection required for routine care of patients in ICU, who have suspected or confirmed COVID-19, who:
    - are not ventilated, or
    - are intubated with a closed ventilator circuit, from whom the risk of airborne transmission is minimal.
        - however, during routine care when the circuit is opened (e.g. to change a heat-moisture exchanger) a P2/N95 respirator should be used or
        - if risk assessment indicates that inadvertent disconnection of the ventilator circuit may occur, e.g. when the patient is moved, use of a P2/N95 respirator should be considered.
- Contact, droplet and **airborne** precautions, including a P2/N95 respirator or equivalent, should be used for care of COVID-19 patients in ICU requiring AGPs
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)

- AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
- the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

- **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (32-35).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (32). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (36).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.

3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.

2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.

1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19: Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)

SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases are required to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

The predominant modes of human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, chills and vomiting. Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (19-21). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (21, 22). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (23, 24).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 3.5% (25); however, this is likely an overestimate for the Australian health setting. The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 25 May 2020, the crude national CFR is 1.4%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 23 August 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 23,057,000 confirmed cases and 800,000 deaths (25). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (26), and declared a pandemic on 12 March 2020 (27).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Routine prevention activities

Travel

Travel restrictions and quarantine requirements have been implemented to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE, avoid contact with sick people, and maintain good personal hygiene.

At present, all individuals returning to Australia from overseas must be quarantined for 14 days after returning to Australia.

Some jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology.

Personal hygiene

Individuals are advised to establish and maintain good hygiene practices. Individuals should:

- Practice good hand hygiene and respiratory hygiene
- Clean frequently touched surfaces regularly with appropriate detergents and disinfectants
- Stay home and not attend public places including work or school if they are unwell

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Physical distancing and gatherings

Physical distancing requirements may be enforced and restrictions have been implemented on public gatherings.

Jurisdictions have implemented restrictions and limitations on individual activities based on local epidemiology to support physical distancing.

All individuals are recommended to:

- Keep a minimum of 1.5m away from others wherever possible
- Avoid physically greeting other people

If individuals are attending public gatherings or venues they should comply with jurisdictional directions including limitations on the number of attendees.

4. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.

2. To identify, quarantine and provide information to contacts.

3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

5. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases and COVID-19 deaths upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and COVID-19 deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

6. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

7. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For further information, refer to outbreak investigation and management in high-risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any person with symptoms clinically compatible with COVID-19 who is tested should stay at home until a negative test is returned or symptoms have resolved, whichever is longer. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Asymptomatic persons tested as a part of screening at workplaces or borders are not required to stay home until a negative test result is returned, unless advised by PHU or relevant jurisdictional authorities. Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). They will do this on day 0–2 and then on day 10–12 of hotel quarantine, with results to be received prior to the end of the quarantine period. Exact arrangements will depend on states and territories. Jurisdictions may also test asymptomatic persons who are quarantined due to interstate travel. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

8. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed, probable, or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*
(https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Collection of upper respiratory samples from asymptomatic members of the public for surveillance purposes

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations but this is a guide:

- Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or feverishness?" and record the response.
- If the person has any symptoms, follow the infection prevention and control precautions above.

- If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in the current context of low or negligible community transmission of COVID-19.
- Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2. In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. Public Health Units (PHUs) should consider this in low prevalence settings, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results. The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for URTI viral pathogens. If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)

- Previous infection with persistent shedding of viral RNA

3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be taken into account. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

9. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (refer below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures** on patients with confirmed, probable or suspected COVID-19**.** Refer to Appendix B for further information.

Note that, consistent with Infection Control Expert Group guidance, previous advice on the use of airborne precautions for care of patients with severe cough has been withdrawn.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND

        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed and probable cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed or probable cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed or probable cases with more severe illness (hospitalisation was indicated for acute COVID-19, regardless of whether or not the case was hospitalised).

   a. Confirmed and probable cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2,3]

b. Confirmed and probable cases without complete resolution of symptoms of acute illness.

The case can be released from isolation if they meet all the following criteria:

- at least 14 days have passed since the onset of symptoms; and
- there has been substantial improvement in symptoms of the acute illness (including resolution of fever for the previous 72 hours)[1,2,3]; and
- the case has had two consecutive respiratory specimens negative[4] for SARS-CoV-2 by PCR taken at least 24 hours apart at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[5] and are identified as confirmed or probable cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[6].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[5] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[6] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (28, 29). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Persons who have been released from isolation should adhere to hygiene and physical distancing measures, as the extent of acquired immunity is unknown. If a recently recovered COVID-19 case becomes a close contact of a confirmed or probable case, they do not need to self-quarantine again. However, the recovered case should not attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) until 14 days after the last unprotected contact with the confirmed case and should self-monitor for symptoms clinically consistent with COVID-19. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. If the recently recovered case is a household contact of a currently isolated case, particular care should be taken with regards to consistent hand hygiene. If the recently recovered case needs medical attention, they should follow the processes outlined in Medical care for quarantined individuals. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or potential COVID-19 patients, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Note: for aerosol-generating procedures performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate. Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

10. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

11. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and are required to self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.
- At the discretion of PHU, the definition of a close contact may be expanded to include a broader range of contacts. This may be relevant where there has been evidence of transmission in a particular circumstance or setting. For example, when transmission is identified in people who have attended the same venue as a confirmed case (e.g. restaurant, pub, place of worship) but have not had close contact with the case.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts are required to self-quarantine at home for 14 days following the last contact with the infectious case, and should be advised to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.

- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

12. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
  - Residential settings such as aged care facilities, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
  - Abattoirs.

<u>Consider if a smaller defined setting is appropriate.</u>

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**<u>Whom to test</u>** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **<u>Actions</u>** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

13. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions, informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place.

Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

14. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

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16. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Note: This appendix has been taken from the *PHLN guidance on laboratory testing for SARS-CoV-2*. This appendix will be updated as PHLN publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance, is available at: https://www.health.gov.au/resources/publications/phln-guidance-on-laboratory-testing-for-sars-cov-2-the-virus-that-causes-covid-19

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, and urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Collection of serum must be performed under transmission-based precautions if they are suspected COVID-19 cases or have proven COVID-19 infection and have not been released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum

Upper respiratory tract samples

1. Nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium. This may include viral (VTM) or universal transport medium (UTM), Liquid Amies or another validated transport medium. Whilst dry swabs are acceptable, swabs in transport medium are preferred.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. A self-collected oropharyngeal and bilateral deep nasal swab may in some circumstances be an appropriate method of specimen collection. However, where possible, health care worker supervision of the collection is encouraged.

    - PHLN has reviewed both domestic and international data that supports that this method of collection is equivalent to a medical practitioner conducting a combined nasal and throat swab in detecting coronavirus (30, 31).

    - This has the potential to reduce infection risk to the health care worker providing the collection and also reduces the requirements for PPE.

    - This method of collection should only be offered at the request of a medical practitioner or under public health direction as part of an agreed procedure with the testing laboratory.

        - The specimen collection method 'SELF COLLECTION' should be clearly documented on the request form by the requesting clinician and the patient should be instructed to document this also on the swab following collection.

    - Clear written instructions should be provided to the patient by the requesting medical practitioner or the pathology service providing the testing.

        - Provision of an accessible instructional video could support the written instructions.

        - If the requesting clinician is providing the swabs directly to the patient (rather than referring the patient to a specific pathology collection centre) then the clinician is responsible for ensuring that the receiving laboratory is able to process self-collect specimens.

    - The location at which the self-collect is conducted is at the discretion of the patient.

    - The self-collect consists of a combined oropharyngeal and bilateral deep nasal, that accesses the throat and then the nasal cavity and should be conducted by following the instructions above, noting that there may be variations in types of swabs available in different jurisdictions and by different pathology providers.

    - It is recommended that laboratories processing these self-collects consider:

        - Clearly identifying the specimen is a self-collected sample;

        - Validating their ability to obtain equivalent viral loads compared to other collection methods;

        - Monitoring positivity rates using these self-collection kits compared to other methods of collection; and

        - Adding a human DNA control to the COVID-19 PCR assay to confirm adequacy of sample collection.

3. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

Lower respiratory tract samples

1. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

2. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the WHO guidance Laboratory biosafety guidance related to coronavirus disease (COVID-19) and noted the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times; and

- Point of care (POC) or near-POC assays can be performed on a bench without employing a BSC, when the local risk assessment so dictates and proper precautions are in place.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing or near point of care testing should be adequately trained and assessed in the appropriate use of PPE and should not be put under increased pressure for test turnaround time. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests. Testing should not be conducted without a validated infectious waste process, including excess specimens in place (31).

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support offers a SARS-CoV-2 specific NAT QAP. This proficiency testing program (PTP) supplements previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. An RCPAQAP sponsored serology proficiency programme is in development with two programs to be offered by the end of 2020.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Note: This appendix is a copy of ICEG guidance and will be updated as ICEG publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance is available at: https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence.
- **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours.
- The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease

in later stages of disease. It has also been reported to increase with late deterioration.

- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.
    - **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
        - large droplets (>10 micron) settle on surfaces close to the source patient
        - small particles (<10 micron) can remain suspended and travel long distances
    - Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
    - A**irborne transmission is believed, by most authorities, to be rare**.
        - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
        - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
        - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The low number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is ~80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see below) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**
- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available

- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

- Contact and droplet precautions are the minimum protection required in the context of CPR of a patient with suspected or confirmed COVID-19. A healthcare worker using contact and droplet precautions can safely commence defibrillation or chest compressions. However, some hospitals may recommend airborne precautions prior to commencement of chest compressions, if feasible.
- **Delay in the commencement of chest compressions should be avoided.**
- **A P2/N95 respirator should be used for active airway management procedures.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

- **Contact and droplet** precautions are minimum protection required for routine care of patients in ICU, who have suspected or confirmed COVID-19, who:
    - are not ventilated, or
    - are intubated with a closed ventilator circuit, from whom the risk of airborne transmission is minimal.
        - however, during routine care when the circuit is opened (e.g. to change a heat-moisture exchanger) a P2/N95 respirator should be used or
        - if risk assessment indicates that inadvertent disconnection of the ventilator circuit may occur, e.g. when the patient is moved, use of a P2/N95 respirator should be considered.
- Contact, droplet and **airborne** precautions, including a P2/N95 respirator or equivalent, should be used for care of COVID-19 patients in ICU requiring AGPs
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)

- AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
- the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

- **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (32-35).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (32). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (36).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death

3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.

2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.

1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases are required to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

The predominant modes of human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is some evidence that COVID-19 infection may lead to intestinal infection and virus can be present in the faeces of infected persons (4). Additionally, airborne transmission of COVID-19 may occur during aerosol-generating procedures. Despite this, current evidence does not support faecal-oral or airborne spread as major drivers in transmission; however, aerosol-generating procedures should be undertaken with appropriate precautions (refer to Aerosol-generating procedures).

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, rhinorrhoea, chills and vomiting. Atypical symptoms of COVID-19 may also occur including chest pain, diarrhoea and conjunctivitis (19-21). Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (22-24). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (24, 25). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (26, 27).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 3.5% (28); however, this is likely an overestimate for the Australian health setting. The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 25 May 2020, the crude national CFR is 1.4%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 23 August 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 23,057,000 confirmed cases and 800,000 deaths (28). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (29), and declared a pandemic on 12 March 2020 (30).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Routine prevention activities

Travel

Travel restrictions and quarantine requirements have been implemented to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE, avoid contact with sick people, and maintain good personal hygiene.

At present, all individuals returning to Australia from overseas must be quarantined for 14 days after returning to Australia.

Some jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology.

Personal hygiene

Individuals are advised to establish and maintain good hygiene practices. Individuals should:

- Practice good hand hygiene and respiratory hygiene
- Clean frequently touched surfaces regularly with appropriate detergents and disinfectants
- Stay home and not attend public places including work or school if they are unwell

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Physical distancing and gatherings

Physical distancing requirements may be enforced and restrictions have been implemented on public gatherings.

Jurisdictions have implemented restrictions and limitations on individual activities based on local epidemiology to support physical distancing.

All individuals are recommended to:

- Keep a minimum of 1.5m away from others wherever possible
- Avoid physically greeting other people

If individuals are attending public gatherings or venues they should comply with jurisdictional directions including limitations on the number of attendees.

4. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.

2. To identify, quarantine and provide information to contacts.

3. To rapidly identify and manage clusters and outbreaks.

4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

5. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases and COVID-19 deaths upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and COVID-19 deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

6. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

7. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For further information, refer to outbreak investigation and management in high-risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any person with symptoms clinically compatible with COVID-19 who is tested should stay at home until a negative test is returned or symptoms have resolved, whichever is longer. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Asymptomatic persons tested as a part of screening at workplaces or borders are not required to stay home until a negative test result is returned, unless advised by PHU or relevant jurisdictional authorities. Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). They will do this on day 0–2 and then on day 10–12 of hotel quarantine, with results to be received prior to the end of the quarantine period. Exact arrangements will depend on states and territories. Jurisdictions may also test asymptomatic persons who are quarantined due to interstate travel. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

8. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed, probable, or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*
(https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Collection of upper respiratory samples from asymptomatic members of the public for surveillance purposes

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations but this is a guide:

- Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or feverishness?" and record the response.
- If the person has any symptoms, follow the infection prevention and control precautions above.

- If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in the current context of low or negligible community transmission of COVID-19.
- Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection. Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Refer to Appendix A for additional SARS-CoV-2 laboratory testing information.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2. In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. Public Health Units (PHUs) should consider this in low prevalence settings, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results. The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for URTI viral pathogens. If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)

- Previous infection with persistent shedding of viral RNA

3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be taken into account. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

9. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix C) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (refer below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and Appendix A) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures** on patients with confirmed, probable or suspected COVID-19**.** Refer to Appendix B for further information.

Note that, consistent with Infection Control Expert Group guidance, previous advice on the use of airborne precautions for care of patients with severe cough has been withdrawn.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND

        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a "surgical" mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix B.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2,3]

3. Confirmed cases with more severe illness (hospitalisation was indicated for acute COVID-19, regardless of whether or not the case was hospitalised).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2,3]

b. Confirmed cases without complete resolution of symptoms of acute illness.

The case can be released from isolation if they meet all the following criteria:

- at least 14 days have passed since the onset of symptoms; and
- there has been substantial improvement in symptoms of the acute illness (including resolution of fever for the previous 72 hours)[1,2]; and
- the case has had two consecutive respiratory specimens negative[4] for SARS-CoV-2 by PCR taken at least 24 hours apart at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[5] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[4] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[6].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. For these people, the treating medical practitioner should make an assessment as to whether the signs and symptoms of COVID-19 have resolved.

[2] If individuals have a persistent post-viral cough with negative test results, they are eligible for release from isolation.

[3] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[4] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[5] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[6] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (31, 32). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and HCWs should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.

- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or potential COVID-19 patients, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Note: for aerosol-generating procedures performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate. Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

10. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

11. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and are required to self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.
- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be

conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix D for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:
- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.
- At the discretion of PHU, the definition of a close contact may be expanded to include a broader range of contacts. This may be relevant where there has been evidence of transmission in a particular circumstance or setting. For example, when transmission is identified in people who have attended the same venue as a confirmed case (e.g. restaurant, pub, place of worship) but have not had close contact with the case.
- Although it has been shown that transmission can occur up to 72 hours prior to symptom onset, in most circumstances there is marginal benefit in identifying close contacts exposed beyond 48 hours prior to symptom onset. In some high-risk settings, public health units may opt for a more precautionary approach and use a time period of 72 hours prior to symptom onset in the case (or first positive PCR test if the case is asymptomatic) when identifying close contacts.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts are required to self-quarantine at home for 14 days following the last contact with the infectious case, and should be advised to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently indicated during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

12. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

    - Residential settings such as aged care facilities, congregate disability accommodation, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

4. **Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.**

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

5. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

6. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

7. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

8. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

9. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

10. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

11. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

12. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

13. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Healthcare worker exposures in the context of PPE use

Where the healthcare worker (HCW) and/or case are using PPE, a risk assessment should be performed to determine whether the contact should be designated as a close contact and quarantined for 14 days (see Tables 2a and 2b). Factors that may be considered include:

- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, wandering).

- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and shield only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Note: exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, public health units may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Continue to work • HCW to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the HCW, and return of a negative result, prior to continuation of work.

Contact tracing in high-risk settings

In high risk settings, an aggressive and proactive approach to contact tracing is required. As a starting position, all staff on the same or overlapping shifts should be regarded as potentially at risk requiring assessment. Potential sources of information might include shift rosters, patient allocation lists, patient documentation, and tea room logs, in addition to interviews with the case and potential contacts. In healthcare settings, it is important to consider all staff groups who may have been present – medical, nursing, allied health, paramedics, pharmacy, cleaners, pastoral care, security, contractors, students and visitors. In addition to face-to-face contact during the course of patient care, other settings such as tea rooms, shared work areas, changing rooms and bathrooms should be considered as potential locations where transmission may occur.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.

- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place.

Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

People with disability

Some people with disability will be at greater risk throughout the COVID-19 pandemic. This is due to:

- Risk of more serious illness if infected by COVID-19.
  - There is a high prevalence of comorbidities amongst people with disability, including chronic conditions and weakened immune systems.
  - Additionally, people with disabilities can have unrecognised, untreated or poorly managed physical or mental health conditions.
- Challenges involved in preventative measures.
  - Physical distancing can also be difficult or impossible for some people with disability. This includes those who rely on support and assistance from family members, carers and support workers.
  - Some people with disability also face barriers to implementing basic hygiene measures and safely wearing face masks. These factors put many people with disability and those that support them at higher potential risk of exposure to the virus.
  - Barriers to adequate deep nasal swabs for PCR.

Some people with disability live at home by themselves, others live with family members, or in congregate disability accommodation such as group homes or larger facilities.

Congregate disability accommodation settings are high-risk settings for infectious disease outbreaks due to higher density living, close physical contact between staff and participants, and large number of visitors and staff moving between the community and facilities. Such settings require increased levels of risk mitigation and support to prevent COVID-19 transmission.

Preventative measures

In addition to usual preventative protocols, congregate disability accommodation should ensure that people with disability and support staff are encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette. Consideration should be given to the communication and support needs of the person with disability, and reasonable adjustments should be made as required. Information should be provided in accessible formats such as Easy Read and Auslan.

Messaging to discourage unwell visitors from visiting people with disability in congregate accommodation should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition.

Outbreaks

Outbreaks of COVID-19 in congregate disability accommodation settings should be managed with reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities. The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia, noting that a supplementary appendix is currently being drafted to address the specific needs of smaller residential care homes or congregate disability accommodation settings.

14. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix D: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances **where all alternative surge workforce strategies are exhausted** and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (33). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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16. Appendices

Appendix A: PHLN guidance on laboratory testing for SARS-CoV-2

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix C: PHU checklist

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Information for donor and transplant professionals

Appendix A: SARS-CoV-2 Laboratory testing information

Note: This appendix has been taken from the *PHLN guidance on laboratory testing for SARS-CoV-2*. This appendix will be updated as PHLN publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance, is available at: https://www.health.gov.au/resources/publications/phln-guidance-on-laboratory-testing-for-sars-cov-2-the-virus-that-causes-covid-19

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, and urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

Serology for SARS-CoV-2 can help identify individuals who have developed detectable antibodies as part of an immune response to the virus. Collection of serum must be performed under transmission-based precautions if they are suspected COVID-19 cases or have proven COVID-19 infection and have not been released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Laboratory testing for SARS-CoV-2 continues to evolve rapidly with the accumulation of clinical data, and as reagents and protocols are refined.

The aim of testing is to, if clinically appropriate, exclude common respiratory viruses using local hospital and community nucleic acid testing capacity, and to simultaneously refer onward to a laboratory with capacity to test for SARS-CoV-2. As co-infection is possible, initial testing protocols should include testing for SARS-CoV-2 in patients with epidemiological risk, even where another infection is shown to be present.

Samples for testing

(i) upper respiratory tract samples
(ii) lower respiratory tract sample if the lower tract is involved
(iii) serum

Upper respiratory tract samples

1. Nasal and oropharyngeal swab: may be dacron or rayon, although flocked is preferred

    - oropharyngeal (throat): swab the tonsillar beds and the back of the throat, avoiding the tongue
    - deep nasal:
        - Using a pencil grip and while gently rotating the swab, insert the tip 2–3 cm (or until resistance is met), into the nostril, parallel to the palate, to absorb mucoid secretion.
        - Rotate the swab several times against the nasal wall.
        - Withdraw the swab and repeat the process in the other nostril. **To conserve swabs** the same swab that has been used to sample the oropharynx should be utilised for nasal sampling.
    - place the swab(s) back into the accompanying transport medium

Sampling both sites, deep nasal and oropharynx, is recommended to optimise the chances of virus detection. The swab(s) should be placed in transport medium. This may include viral (VTM) or universal transport medium (UTM), Liquid Amies or another validated transport medium. Whilst dry swabs are acceptable, swabs in transport medium are preferred.

If SARS-CoV-2 testing is to be undertaken in a different laboratory to testing for other respiratory viruses, then the original swab and remaining eluate should be forwarded for SARS-CoV-2 testing.

2. A self-collected oropharyngeal and bilateral deep nasal swab may in some circumstances be an appropriate method of specimen collection. However, where possible, health care worker supervision of the collection is encouraged.

    - PHLN has reviewed both domestic and international data that supports that this method of collection is equivalent to a medical practitioner conducting a combined nasal and throat swab in detecting coronavirus (34, 35).

    - This has the potential to reduce infection risk to the health care worker providing the collection and also reduces the requirements for PPE.

    - This method of collection should only be offered at the request of a medical practitioner or under public health direction as part of an agreed procedure with the testing laboratory.

        - The specimen collection method 'SELF COLLECTION' should be clearly documented on the request form by the requesting clinician and the patient should be instructed to document this also on the swab following collection.

    - Clear written instructions should be provided to the patient by the requesting medical practitioner or the pathology service providing the testing.

        - Provision of an accessible instructional video could support the written instructions.

        - If the requesting clinician is providing the swabs directly to the patient (rather than referring the patient to a specific pathology collection centre) then the clinician is responsible for ensuring that the receiving laboratory is able to process self-collect specimens.

    - The location at which the self-collect is conducted is at the discretion of the patient.

    - The self-collect consists of a combined oropharyngeal and bilateral deep nasal, that accesses the throat and then the nasal cavity and should be conducted by following the instructions above, noting that there may be variations in types of swabs available in different jurisdictions and by different pathology providers.

    - It is recommended that laboratories processing these self-collects consider:

        - Clearly identifying the specimen is a self-collected sample;

        - Validating their ability to obtain equivalent viral loads compared to other collection methods;

        - Monitoring positivity rates using these self-collection kits compared to other methods of collection; and

        - Adding a human DNA control to the COVID-19 PCR assay to confirm adequacy of sample collection.

3. Nasal wash/aspirates

    - collect 2-3 mL into a sterile, leak-proof, screw-top dry sterile container

    A nasal wash or aspirate, if available, may be substituted for the deep nasal swab sample described above.

Lower respiratory tract samples

1. Bronchoalveolar lavage, tracheal aspirate, pleural fluid

    - collect 2-3 mL into a sterile, leak-proof, screw-top sputum collection cup or dry sterile container

2. Sputum

    - patient should rinse his/her mouth with water before collection
    - expectorate deep cough sputum directly into a sterile, leak-proof, screw-top dry sterile container

As lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV, it is advised that lower respiratory tract specimens should be collected for SARS-CoV-2 testing where possible. Initial experience in testing for SARS-CoV-2 seems to be consistent with this prior experience. Repeat testing (especially of lower respiratory tract specimens) in clinically compatible cases should be performed if initial results are negative and there remains a high index of suspicion of infection.

Serology

Serum should be collected during the acute phase of the illness (preferably within the first 7 days of symptom onset), stored, and tested in parallel with convalescent sera collected 2 or more weeks after the onset of illness. If no acute sample was collected, sera collected 14 or more days after symptom onset may be tested.

Specimen handling in the laboratory

Microbiology Laboratory

Laboratory staff should handle specimens under PC2 conditions in accordance with AS/NZS 2243.3:2010 Safety in Laboratories Part 3: Microbiological Safety and Containment. Specimens should be transported in accordance with current regulatory requirements as diagnostic samples for testing.

Point of care testing outside a PC2 facility

PHLN members considered the WHO guidance Laboratory biosafety guidance related to coronavirus disease (COVID-19) and noted the highlighted recommendations which refer to laboratory-based work:

- All procedures must be performed based on risk assessment and only by personnel with demonstrated capability, in strict observance of any relevant protocols at all times; and

- Point of care (POC) or near-POC assays can be performed on a bench without employing a BSC, when the local risk assessment so dictates and proper precautions are in place.

Diagnostic testing steps for specimens conducted outside of a PC2 facility (such as rapid respiratory testing performed at, or near, the point of care) should be assessed to determine if aerosol generation may occur, to inform which Transmission-based Precautions should be applied, to provide a barrier between the specimen and personnel during specimen manipulation. If local community transmission is established, consideration should be given to implementing airborne precautions. Staff undertaking point of care testing or near point of care testing should be adequately trained and assessed in the appropriate use of PPE and should not be put under increased pressure for test turnaround time. Testing should be done in a well ventilated room, preferably with an external exhaust fan. Testing in non NATA/RCPA accredited medical pathology facilities should also adhere to the current NPAAC regulatory framework with respect to point of care tests. Testing should not be conducted without a validated infectious waste process, including excess specimens in place (35).

Clinical Pathology

Non-respiratory specimens (blood, urine, and stool) are known to contain virus. Standard precautions should be used for non-microbial pathology testing (such as routine biochemistry and haematology). Where possible auto-analysers should be used according to standard practices and/or local protocols. There is evidence that capping and uncapping of samples is not a high risk aerosol generating procedure.

Respiratory Virus Diagnostic Testing

Nucleic acid testing of the upper or lower respiratory tract samples is performed for influenza and other common respiratory viruses using standard protocols and methods of the hospital or community laboratory.

Standard protocols of the testing laboratory for respiratory sample processing should be used. This is expected to consist of PC2 laboratory practices, and use of a Class II Biosafety cabinet for aerosol-generating procedures (such as centrifuging without sealed carriers, vortexing). Viral culture can only be undertaken in an accredited laboratory that has a PC3 facility.

The residue (original swab and remaining eluate) of the upper tract sample is forwarded together with the lower tract sample and the serum to the reference laboratory with SARS-CoV-2 testing capacity requesting SARS-CoV-2 testing.

Clinical liaison with jurisdictional public health officers is essential to coordinate referral and testing.

Standard protocols should be used for sample packaging and transport as diagnostic samples for testing (i.e. Category B).

SARS-CoV-2 specific testing

Nucleic acid testing

Nucleic acid testing (NAT) using real time polymerase chain reaction (RT-PCR) is the method of choice for detection of SARS-CoV-2. Specific diagnostic test approaches for SARS-CoV-2 will be described here only in broad terms. There is significant variation in PCR assays employed by different PHLN member laboratories and non PHLN laboratories performing these tests, and test algorithms are likely to be further refined over time. Commercial assays are becoming available from March 2020 and evaluation of these, or reference to another laboratory evaluation, needs to be performed prior to introduction.

Specific Real Time PCR primer sets to detect SARS-CoV-2 are available. Some PHLN member laboratories have designed their own, and some have implemented primer sets recommended to the World Health Organization (WHO) by leading international coronavirus reference laboratories (available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance). The majority of PHLN testing capacity now employs relatively swift RT-PCR assays for screening, with a laboratory turnaround time of several hours. Confirmation of positives is being done either with RT-PCR assays detecting a different target gene, or broadly reactive PCR tests with sequencing of amplicons (see below).

Well pedigreed PCR primer sets, probes and protocols are available from the WHO/ European Viral Archive (EVAg) (available at https://www.who.int/docs/default-source/coronaviruse/protocol-v2-1.pdf?sfvrsn=a9ef618c_2).

Many PCR assays, including those available through WHO will also detect other zoonotic coronaviruses such as SARS-CoV, sometimes with a recognisable shift in the cycle threshold value (Ct) compared to the SARS-CoV-2 target, but not commonly circulating coronaviruses usually detected by commercial assays (e.g. NL63, 229E strains).

Several Australian PHLN reference laboratories began diagnostic testing for the current outbreak using PCR assays capable of detecting a wide range of coronaviruses, including zoonotic and novel pathogens. A number of these were mapped against the promulgated nucleic acid sequence of SARS-CoV-2 from Wuhan, China (GenBank accession MN908947, December 2019) early in the course of the outbreak. Nucleic acid sequencing of amplicons from positive tests is used to identify the coronavirus in this approach. These assays have relatively long turnaround times and have largely been replaced by RT-PCR other than as a confirmatory test in some laboratories.

Complementary DNA (cDNA) synthesized from the VIDRL SARS-CoV-2 has now been made available to all PHLN member laboratories as a test positive control. Synthetic positive control material in the form of nucleic acid templates is also available through WHO/ European Viral Archive (EVAg).

There is variable use of one or two viral targets for SARS-CoV-2 testing. Confirmatory testing using an alternative target, at least in the early stages, for positive samples, is recommended if using a single target.

Testing algorithms are likely to be revised pending further information about the virus, and the number of specimens received in the laboratory for testing.

Viral culture should not be performed for routine diagnosis, and should only be attempted in reference laboratories with appropriate experience and containment facilities. Currently where attempted this is being done at Physical Containment Level 3 (PC3), consistent with current recommendations for SARS-CoV, pending specific SARS-CoV-2 international recommendations.

The Royal College of Pathologists of Australasia Quality Assurance Program (RCPAQAP), with Australian Government support offers a SARS-CoV-2 specific NAT QAP. This proficiency testing program (PTP) supplements previous SARS-CoV, MERS-CoV and other coronaviruses PTP. A second, more detailed PTP is planned to be performed by the RCPA QAP in mid-2020. An RCPAQAP sponsored serology proficiency programme is in development with two programs to be offered by the end of 2020.

Serology

Serology does not currently have a role in the diagnosis of COVID-19 during the acute illness but can be helpful for the diagnosis of past cases, such as for public health follow up of suspected cases who either did not undergo NAT during the acute illness or were NAT negative. Serology will also be important for broad-based surveillance, vaccine efficacy and research activities.

Serology for the determination of past COVID-19 is performed using either in-house methodology or commercially manufactured kits. The SARS-CoV-2 antigens are the four structural proteins: the spike, membrane, envelope and nucleocapsid proteins. Antibody tests to date have used either whole virion or the complete or certain domains of the spike protein and the nucleocapsid protein. The nucleoprotein is the most abundant viral protein whereas the spike protein is the most diverse across the coronaviruses, and therefore the most specific for SARS-CoV-2. The temporal pattern of antibody expression has not been fully elucidated and the persistence of the antibody isotypes is currently unknown. Early evidence suggests that IgM, IgA, IgG and neutralising antibodies become detectable between one and two weeks after illness onset in the majority of cases but some NAT-confirmed COVID-19 cases have not shown seroconversion.

It is recommended that antibody detection be performed using a validated assay meeting acceptable and documented performance standards. Laboratory-based antibody assays available or in development include neutralization assays, enzyme-linked immunosorbent assays, microsphere immunoassays and immunofluorescence assays. A number of point-of-care serological tests have been approved by the Therapeutic Goods Administration subject to conditions, including restrictions on who can obtain them. See '*Public Health Laboratory Ne*twork *Statement on Point-of-Care Serology Testing for SARS-CoV-2 (the virus that causes COVID-19)*' for more information. No SARS-CoV-2 western blot assay or SARS-CoV-2 antigen test is currently available.

A seroconversion, or significant rise (e.g. four-fold or greater titre rise) in either neutralising or IgG antibody level is definitive laboratory evidence of SARS-CoV-2 infection whereas detection of neutralising or IgG antibody in a single specimen from a person meeting clinical criteria for COVID-19 is suggestive evidence of SARS-CoV-2 infection. The role of serology for the diagnosis of COVID-19 will be reviewed as more information on the serological response to SARS-CoV-2 becomes available.

The role of serology in determining immunity to SARS-CoV-2 is currently unclear. The development of neutralising antibodies to the spike protein, the virus receptor responsible for host cell entry, has been shown but the correlation of antibodies detected using different methods with virus neutralisation is not known. Further, more studies are needed to determine whether the development of neutralising antibodies to SARS-CoV-2 is indicative of protection from reinfection.

Further Information

The Department of Health has produced a series of resources on COVID-19 for health professionals, including pathology providers and healthcare managers, these may be accessed here: (https://www.health.gov.au/resources/collections/coronavirus-covid-19-resources-for-health-professionals-including-aged-care-providers-pathology-providers-and-healthcare-managers)

Appendix B: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Note: This appendix is a copy of ICEG guidance and will be updated as ICEG publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance is available at: https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence.
- **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours.
- The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus
    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease

in later stages of disease. It has also been reported to increase with late deterioration.

- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.
    - **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
        - large droplets (>10 micron) settle on surfaces close to the source patient
        - small particles (<10 micron) can remain suspended and travel long distances
    - Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
    - A**irborne transmission is believed, by most authorities, to be rare**.
        - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
        - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
        - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The low number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is ~80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see below) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**
- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available

- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

- Contact and droplet precautions are the minimum protection required in the context of CPR of a patient with suspected or confirmed COVID-19. A healthcare worker using contact and droplet precautions can safely commence defibrillation or chest compressions. However, some hospitals may recommend airborne precautions prior to commencement of chest compressions, if feasible.
- **Delay in the commencement of chest compressions should be avoided.**
- **A P2/N95 respirator should be used for active airway management procedures.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

- **Contact and droplet** precautions are minimum protection required for routine care of patients in ICU, who have suspected or confirmed COVID-19, who:
    - are not ventilated, or
    - are intubated with a closed ventilator circuit, from whom the risk of airborne transmission is minimal.
        - however, during routine care when the circuit is opened (e.g. to change a heat-moisture exchanger) a P2/N95 respirator should be used or
        - if risk assessment indicates that inadvertent disconnection of the ventilator circuit may occur, e.g. when the patient is moved, use of a P2/N95 respirator should be considered.
- Contact, droplet and **airborne** precautions, including a P2/N95 respirator or equivalent, should be used for care of COVID-19 patients in ICU requiring AGPs
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)

- AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
- the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)
    - On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
    - If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

- **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website

Appendix C: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (36-39).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (36). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (40).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.

3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
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2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.

2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.

1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed and probable cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed, probable or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases are required to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

The predominant modes of human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is a gradient from large droplets to very small particles (aerosols), which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures). Certain behaviours, such as singing and shouting, could also increase the force and range of spread of both large and small particles. In poorly ventilated, crowded indoor environments, small particles, which are normally rapidly dispersed may remain suspended or be recirculated for longer periods

There is some evidence that COVID-19 infection may lead to intestinal infection and SARS-CoV-2 can be present in the faeces of infected persons (4). However, to date, there is no evidence of faecal-oral transmission.

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, rhinorrhoea, chills and vomiting. Atypical symptoms of COVID-19 may also occur including chest pain, diarrhoea and conjunctivitis (19-21). Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (22-24). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (24, 25). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (26, 27).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.7% (28). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 26 October 2020, the crude national CFR is 3.3%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Immune response

The immune response, including duration of immunity and duration of antibody response to SARS-CoV-2 infection is yet to be determined. Preliminary evidence suggests IgM and IgG antibody levels to SARS-CoV-2 may wane overtime, however more studies are required to accurately determine the duration of immunity and correlates of protection for COVID-19 (29-31).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 23 August 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 23,057,000 confirmed cases and 800,000 deaths (28). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (32), and declared a pandemic on 12 March 2020 (33).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a “human biosecurity emergency” under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Routine prevention activities

Travel

Travel restrictions and quarantine requirements have been implemented to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE, avoid contact with sick people, and maintain good personal hygiene.

At present, all individuals returning to Australia from overseas must be quarantined for 14 days after returning to Australia.

Some jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology.

Personal hygiene

Individuals are advised to establish and maintain good hygiene practices. Individuals should:

- Practice good hand hygiene and respiratory hygiene
- Clean frequently touched surfaces regularly with appropriate detergents and disinfectants
- Stay home and not attend public places including work or school if they are unwell

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Physical distancing and gatherings

Physical distancing requirements may be enforced and restrictions have been implemented on public gatherings.

Jurisdictions have implemented restrictions and limitations on individual activities based on local epidemiology to support physical distancing.

All individuals are recommended to:

- Keep a minimum of 1.5m away from others wherever possible
- Avoid physically greeting other people

If individuals are attending public gatherings or venues they should comply with jurisdictional directions including limitations on the number of attendees.

4. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.
4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

5. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases and COVID-19 deaths upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and COVID-19 deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

6. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

7. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For further information, refer to outbreak investigation and management in high-risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any person with symptoms clinically compatible with COVID-19 who is tested should stay at home until a negative test is returned or symptoms have resolved, whichever is longer. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Asymptomatic persons tested as a part of screening at workplaces or borders are not required to stay home until a negative test result is returned, unless advised by PHU or relevant jurisdictional authorities.

Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix D.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). They will do this on day 0–2 and then on day 10–12 of hotel quarantine, with results to be received prior to the end of the quarantine period. Exact arrangements will depend on states and territories. Jurisdictions may also test asymptomatic persons who are quarantined due to interstate travel. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

8. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed, probable, or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.

- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Collection of upper respiratory samples from asymptomatic members of the public for surveillance purposes

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations but this is a guide:

- Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or feverishness?" and record the response.
- If the person has any symptoms, follow the infection prevention and control precautions above.
- If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in the current context of low or negligible community transmission of COVID-19.
- Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix A. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Approach to testing and specimen collection

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

For advice on selecting the appropriate specimen for diagnostic reverse transcriptase – polymerase chain reaction (RT-PCR) testing for COVID-19, refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

RT-PCR of respiratory tract samples (see PHLN guidance on laboratory testing for SARS-CoV-2) remains the gold standard for diagnostic testing for COVID-19. New methods for specimen collection such as saliva samples are being investigated. Other tests for presence of antigen or antibodies may have regulatory or legal restrictions in place. Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for additional information prior to use.

Laboratory-based serology tests can help identify individuals who have developed detectable antibodies as part of an immune response to SARS-CoV-2. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection.

Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Some jurisdictions have demonstrated significant benefits of using SARS-CoV-2 genomics to inform their public health response. Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for further information.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2. In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. Public Health Units (PHUs) should consider this in low prevalence settings, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results. The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for URTI viral pathogens. If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify ‘potential source contacts’.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be taken into account. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

9. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix B) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant ‘release from isolation’ criteria (refer below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed, probable, and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and PHLN guidance on laboratory testing for SARS-CoV-2) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed, probable, or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures** on patients with confirmed, probable or suspected COVID-19**.** Refer to Appendix A for further information.

Note that, consistent with Infection Control Expert Group guidance, previous advice on the use of airborne precautions for care of patients with severe cough has been withdrawn.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the suspect, probable, or confirmed case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or an isolation room with the door closed if a negative pressure room is not available).
    - needs to be transferred out of their isolation room, the patient should wear a “surgical” mask and follow respiratory hygiene and cough etiquette.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix A.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2]

   b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

   The case can be released from isolation if they meet both of the following criteria[2]:

   - at least 20 days have passed since the onset of symptoms; and
   - the case is not significantly immunocompromised[4]

   OR

   The case can also be released from isolation if they meet all the following criteria:

   - at least 14 days have passed since the onset of symptoms;
   - there has been substantial improvement in respiratory symptoms of the acute illness (including resolution of fever for the previous 72 hours)[1]; and
   - the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (34, 35). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is **not** necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and HCWs should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.

- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix A.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or potential COVID-19 patients, such as bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

P2/N95 respirators should be used only when required. Unless used correctly, i.e. with fit-checking, they are unlikely to protect against airborne pathogen spread.

Note: for aerosol-generating procedures performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate. Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

10. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

11. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and are required to self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.

- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix C for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix C for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.
- At the discretion of PHU, the definition of a close contact may be expanded to include a broader range of contacts. This may be relevant where there has been evidence of transmission in a particular circumstance or setting. For example, when transmission is identified in people who have attended the same venue as a confirmed case (e.g. restaurant, pub, place of worship) but have not had close contact with the case.
- Although it has been shown that transmission can occur up to 72 hours prior to symptom onset, in most circumstances there is marginal benefit in identifying close contacts exposed beyond 48 hours prior to symptom onset. In some high-risk settings, public health units may opt for a more precautionary approach and use a time period of 72 hours prior to symptom onset in the case (or first positive PCR test if the case is asymptomatic) when identifying close contacts.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts are required to self-quarantine at home for 14 days following the last contact with the infectious case, and should be advised to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently mandatory during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Jurisdictional communicable disease authorities or PHUs may consider testing during the quarantine period:

- Entry testing – a positive test result would support a decision to move the person to an alternative place of quarantine where household quarantine is not ideal, and would also bring forward contact tracing for that person. This is particularly important to consider if the contact is associated with a high-risk setting.
- Exit testing – finding a positive test result late in the quarantine period (day 10–12) of a close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community. Again, this is particularly important to consider if the contact is associated with a high-risk setting.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

12. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, congregate disability accommodation, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

4. Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

5. Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

6. Collate information.

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

7. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

8. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

9. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

10. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

11. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

13. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Healthcare worker exposures in the context of PPE use

Where the healthcare worker (HCW) and/or case are using PPE, a risk assessment should be performed to determine whether the contact should be designated as a close contact and quarantined for 14 days (see Tables 2a and 2b). Factors that may be considered include:

- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, wandering).

- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and shield only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Note: exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, public health units may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Continue to work • HCW to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the HCW, and return of a negative result, prior to continuation of work.

Contact tracing in high-risk settings

In high risk settings, an aggressive and proactive approach to contact tracing is required. As a starting position, all staff on the same or overlapping shifts should be regarded as potentially at risk requiring assessment. Potential sources of information might include shift rosters, patient allocation lists, patient documentation, and tea room logs, in addition to interviews with the case and potential contacts. In healthcare settings, it is important to consider all staff groups who may have been present – medical, nursing, allied health, paramedics, pharmacy, cleaners, pastoral care, security, contractors, students and visitors. In addition to face-to-face contact during the course of patient care, other settings such as tea rooms, shared work areas, changing rooms and bathrooms should be considered as potential locations where transmission may occur.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.

- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place.

Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

People with disability

Some people with disability will be at greater risk throughout the COVID-19 pandemic. This is due to:

- Risk of more serious illness if infected by COVID-19.
    - There is a high prevalence of comorbidities amongst people with disability, including chronic conditions and weakened immune systems.
    - Additionally, people with disabilities can have unrecognised, untreated or poorly managed physical or mental health conditions.
- Challenges involved in preventative measures.
    - Physical distancing can also be difficult or impossible for some people with disability. This includes those who rely on support and assistance from family members, carers and support workers.
    - Some people with disability also face barriers to implementing basic hygiene measures and safely wearing face masks. These factors put many people with disability and those that support them at higher potential risk of exposure to the virus.
    - Barriers to adequate deep nasal swabs for PCR.

Some people with disability live at home by themselves, others live with family members, or in congregate disability accommodation such as group homes or larger facilities.

Congregate disability accommodation settings are high-risk settings for infectious disease outbreaks due to higher density living, close physical contact between staff and participants, and large number of visitors and staff moving between the community and facilities. Such settings require increased levels of risk mitigation and support to prevent COVID-19 transmission.

Preventative measures

In addition to usual preventative protocols, congregate disability accommodation should ensure that people with disability and support staff are encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette. Consideration should be given to the communication and support needs of the person with disability, and reasonable adjustments should be made as required. Information should be provided in accessible formats such as Easy Read and Auslan.

Messaging to discourage unwell visitors from visiting people with disability in congregate accommodation should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition.

Outbreaks

Outbreaks of COVID-19 in congregate disability accommodation settings should be managed with reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities. The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia, noting that a supplementary appendix is currently being drafted to address the specific needs of smaller residential care homes or congregate disability accommodation settings.

14. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix C: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances **where all alternative surge workforce strategies are exhausted** and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (36). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix B: PHU checklist

Appendix C: Risk assessment and identification of close contacts in aircrew

Appendix D: Information for donor and transplant professionals

Appendix A: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak.

Note: This appendix is a copy of ICEG guidance and will be updated as ICEG publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance is available at: https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Background

This guidance was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC) to provide guidance on the use of personal protective equipment (PPE) in hospital settings during the COVID-19 outbreak.

These recommendations are based on *current evidence, current status of COVID-19 in Australia*, risk assessment and expert advice. This guidance will be updated as new information becomes available or the epidemiology changes significantly.

This guidance is intended for health care workers in hospital settings including emergency department (ED), intensive care unit (ICU), operating suite, surgery, general medical and surgical wards and obstetrics. The same principles apply to general and neonatal paediatrics, but detailed discussion of their application in paediatric practice is outside the scope of this document.

Refer to above for current case definitions and testing criteria.

Guidance on the use of personal protective equipment (PPE) in non-inpatient healthcare settings during the COVID-19 outbreak is available here.

Further information on the use of masks and respirators in the context of COVID-19 is available here.

NOTE: For clinical care of patients who are NOT potential or confirmed COVID-19 cases, standard infection prevention and control precautions – including use of PPE if required – should be observed i.e. business as usual.

CURRENT EVIDENCE

Evidence relating to transmission of COVID-19 in hospitals is variable, sometimes contradictory and cannot always be extrapolated to the Australian context. Many uncertainties remain. The following advice is based on the best available evidence and the current epidemiology of COVID-19 in Australia, where community transmission is minimal, except in limited geographic areas.

- **Asymptomatic COVID-19** has been observed and can occur at any age. Its incidence and role in transmission is not yet known. High rates of asymptomatic infection have been reported during outbreaks in closed settings e.g. cruise ships, aged care facilities, or in the context of high community prevalence.
- **Presymptomatic transmission** is well documented; the duration of infectivity before the onset of symptoms is uncertain but limited evidence suggests it can be up to 48 hours.
- The relationships between **viral RNA load and infectivity or disease stage** are uncertain
    - The presence of viral RNA does not necessarily indicate viable/infectious virus

    - Viral RNA load at different stages of disease varies. It has been reported to be relatively high in the early stage, even when symptoms are mild, but to decrease in later stages of disease. It has also been reported to increase with late deterioration.
- There is limited and sometimes contradictory evidence about the mode of transmission of COVID-19 and its relevance to the type of respiratory protection required in different settings.
    - **Respiratory droplets** produced by breathing, talking and coughing contain **particles of varied sizes.**
        - large droplets (>10 micron) settle on surfaces close to the source patient
        - small particles (<10 micron) can remain suspended and travel long distances
    - Clinical and epidemiological evidence suggest that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets.**
    - A**irborne transmission is believed, by most authorities, to be rare**.
        - The quantity of virus contained in small particles (<10 micron) is significantly less than in large droplets and viability is rapidly lost by desiccation.
        - The transmission dynamics of COVID-19 differ significantly from those of the few infectious diseases for which airborne transmission is recognised e.g. TB, measles, varicella, for which reproductive numbers are much higher.
        - Some high risk aerosol-generating procedures are likely to increase the risk of COVID-19 transmission.

CURRENT STATUS OF COVID-19 IN AUSTRALIA

- By international standards, Australia has a high (and increasing) rate of testing and a very low percentage of positive results – currently (mid-May 2020) <1%.
- More than 60% of total cases in Australia (to mid-May 2020) have been acquired overseas.
- The low number of cases and deaths from COVID-19 in Australia are in marked contrast to those in many parts of Europe, the United Kingdom and North America.
- Since the introduction of travel restrictions and physical distancing measures, the daily number of new infections in Australia has fallen dramatically.
- Community transmission is modest and limited to a few localised sites.
- The case fatality rate in Australia, overall, is <2% and the median age of death is ~80 years.
- Limited data are available about COVID-19 cases in healthcare workers. Of those for which information is available, a significant proportion were not occupationally-acquired.

These data indicate that current containment measures in community and health care settings in Australia are effective, if consistently observed.

General guidance on procedures performed on patients who are NOT suspected or confirmed cases of COVID-19

During the COVID-19 outbreak, PPE for the care of patients who are NOT confirmed or potential cases of COVID-19 should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*[4].

[4] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment to determine the level of PPE required, if any.

Cough etiquette and respiratory hygiene must be observed at all times.

Physical distancing during the COVID-19 outbreak: healthcare staff should stay at least 1.5m away from other people including:

- patients, except when unavoidable, e.g. during physical examination/care AND
- members of the public, hospital visitors and other staff e.g. in wards, clinics and nonclinical areas e.g. during meetings, in offices and shared workplaces and during tea breaks etc.

Aerosol-generating procedures (AGPs) performed on non-COVID-19 patients.

- Given the current low prevalence of COVID-19 in Australia, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19. A surgical mask, gown, gloves, eye protection (and head covering if required as regular theatre attire) would typically be worn. A P2 or N95 respirator is not required in this context.

NOTE: For AGPs performed on patients who are NOT suspected or confirmed cases of COVID-19, P2 respirators are not required, i.e., a surgical mask is appropriate.

General guidance on procedures performed on patients who ARE potential or confirmed COVID-19 cases.

Care of patients with acute respiratory symptoms or potential or confirmed COVID-19

- Standard precautions, cough etiquette and physical distancing apply, as for all patients
- Patients with acute respiratory symptoms should be asked to wear a surgical mask upon presentation to hospital.
- Patients should be placed in a single room with the door closed or in a physically separated closed area designated for suspected COVID-19 cases.
- The minimum requirement for an AGP on a patient with suspected or confirmed COVID-19 is a single room with the door closed or a space at least 3m from other patients, designated for the purpose. However, if possible, a high risk AGP (see below) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated area is necessary, the patient should wear a surgical mask during transfer and practice respiratory hygiene and cough etiquette.

Environmental hygiene

- In addition to routine cleaning, frequently touched surfaces should be cleaned frequently, preferably after each use, or whenever visibly soiled, with detergent/disinfectant wipes or a detergent product, using disposable or laundry safe cloth

Advice on *Environmental cleaning and disinfection for health and residential care facilities* is available on the Department of Health website.

Transmission-based precautions

- **Contact and droplet precautions** should be used for the routine care of patients with confirmed or potential COVID-19. **Contact, droplet and airborne precautions** should be used when performing AGPs on these patients.

NOTE: Previous advice to use airborne precautions for care of patients with severe coughing has been withdrawn because:

- **viral load does not necessarily correlate with the stage or severity of COVID-19**
- **coughing predominantly generates droplets**
- **surgical masks used by patient and healthcare worker provide adequate protection**

Transmission of COVID-19

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face

Contact and droplet precautions; PPE for use in routine care of patients with confirmed or potential COVID-19

The following PPE should be put on before entering the patient's room:

- Long-sleeved, preferably fluid-resistant, gown or apron
    - a cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of splash is low (e.g. specimen collection, observations, medication delivery)
- Surgical mask. Varying levels (1,2,3) of fluid resistant surgical masks are available. When the likelihood of exposure to body fluid is low, in routine care, a level 1 surgical mask is appropriate. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.
- Eye protection: face shield, wrap-around safety glasses, visor or goggles
- Disposable non-sterile gloves when in direct contact with patient (use hand hygiene before donning and after removing gloves)

Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.

Long hair should be securely tied back.

A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion).

Care should be taken to avoid self-contamination when removing PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps. The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection and mask outside the patient's room and perform hand hygiene.

Unsoiled PPE can be discarded into general waste; if visibly soiled e.g. with blood or faeces, PPE should be disposed of as clinical/infectious waste. (**Note:** local jurisdictional regulations for waste disposal should be followed).

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Contact and airborne precautions: use of PPE during AGPs for patients with confirmed or potential COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter (P2/N95) respirator** or equivalent instead of a surgical mask – all other components of standard, contact and droplet precautions remain the same.

Principles of use of P2/N95 respirators in COVID-19

- P2/N95 respirators should be used only in the context of AGPs
- Health care professionals who use P2/N95 respirators should be trained in their correct use, including how to perform fit-checking and safe removal
- Unless P2/N95 respirators are used correctly, protection against airborne pathogen transmission will be compromised

Fit-checking is the minimum standard **for each occasion of use** of a P2/N95 respirator.

- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the respirator. If this is the case, facial hair should be removed or an alternative type of respiratory – e.g. powered air-purifying respiratory (PAPR) – considered (see below)
- If available, a range of types and sizes of P2/N95 respirators may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable P2/N95 respirator cannot be found an alternative - e.g. PAPR - should be considered.

Fit-testing is defined in the Australian/New Zealand Standard 1715 2009 as a validated method for matching P2/N95 respirators with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all healthcare professionals, who may need to use P2/N95 respirators, will be difficult due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used – this reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of P2/N95 respirators – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered air-purifying respirators (PAPR)

- PAPRs are a possible alternative to P2/N95 respirators in selected circumstances
- A number of different types of relatively lightweight, comfortable PAPRs is available

- The use of a PAPR may not provide any additional protection compared to a well sealed P2/N95 respirator
- PAPRs should only be used by healthcare professionals trained in their use, including safe removal in correct sequence; respirator is last item of PPE to be removed
- PAPRs should be used according to the manufacturer's instructions
- If a health care professional is required to remain in the patient's room continuously for a long period to perform multiple AGPs e.g. more than one hour, the use of a PAPR may be considered for additional comfort and visibility
- PAPRs used during sterile procedures should be suitable for use to maintain sterile field
- PAPRs designed for use in settings outside of healthcare are not recommended
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters should strictly be followed

Care is required with removal of a PAPR, which is associated with a risk of self-contamination.

Only PPE marked as reusable should be reused after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of after use.

Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19 may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of AGPs.

Instrumentation or surgical procedures on the respiratory tract including:

- Insertion or removal of endotracheal tube and related procedures e.g. manual ventilation and open suctioning of the respiratory tract
- Bronchoscopy and upper airway procedures that involve open suctioning
- Tracheotomy/tracheostomy (insertion, removal, open suctioning)
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung
- Post-mortem procedures involving high speed devices on the respiratory tract
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit

Other procedures that can generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP)
- Collection of induced sputum
- High flow nasal oxygen
- Upper gastrointestinal instrumentation that involves open suctioning of URT
- Some dental procedures e.g. involving high speed drilling

Cardiopulmonary resuscitation (CPR) is a special circumstance:

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[5] of AGPs showed that CPR was a high risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**

[5] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

- Contact and droplet precautions are the minimum protection required in the context of CPR of a patient with suspected or confirmed COVID-19. A healthcare worker using contact and droplet precautions can safely commence defibrillation or chest compressions. However, some hospitals may recommend airborne precautions prior to commencement of chest compressions, if feasible.
- **Delay in the commencement of chest compressions should be avoided.**
- **A P2/N95 respirator should be used for active airway management procedures.**
- In the context of a low rate of community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.

Use of PPE in specific hospital settings

Intensive care unit (ICU)

- **Contact and droplet** precautions are minimum protection required for routine care of patients in ICU, who have suspected or confirmed COVID-19, who:
    - are not ventilated, or
    - are intubated with a closed ventilator circuit, from whom the risk of airborne transmission is minimal.
        - however, during routine care when the circuit is opened (e.g. to change a heat-moisture exchanger) a P2/N95 respirator should be used or
        - if risk assessment indicates that inadvertent disconnection of the ventilator circuit may occur, e.g. when the patient is moved, use of a P2/N95 respirator should be considered.
- Contact, droplet and **airborne** precautions, including a P2/N95 respirator or equivalent, should be used for care of COVID-19 patients in ICU requiring AGPs
    - If a healthcare professional is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of P2/N95 respirators and PAPRs, by an infection prevention and control professional or other suitably qualified educator.

Wards, including care of critically ill patients outside of the ICU setting

- Contact and **droplet** precautions should be used for care of COVID-19 patients in general wards
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients in general wards, when performing an AGP
    - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Emergency departments

- Contact and **droplet** precautions should be used for routine care of COVID-19 patients in the emergency department
- Contact, droplet and **airborne** precautions should be used for care of COVID-19 patients when performing an AGP (e.g. passage of an endotracheal tube)
    - AGPs should be performed in a negative pressure room, where possible (or a standard isolation room with door closed)
    - the number of persons present in the room should be minimised

Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT confirmed or potential cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during elective surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency

Separate guidelines are available for use of PPE by anaesthetic and surgical staff caring for patients with confirmed or potential COVID-19 in the operating suite, during different types of surgery or procedures.

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected/confirmed COVID-19
- **Contact, droplet and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected/confirmed COVID-19

Labour ward

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- **Contact and droplet precautions** should be observed by labour ward staff, in addition to standard precautions
- The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[6]. Precautions required to protect labour ward staff include:
    - On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect staff); in the labour ward put on a gown (to protect clothes from blood/liquor)

[6] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

- On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises
- If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the PHU and wear a mask until reaching home.
- **A person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website

Appendix B: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix C: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix D: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (37-40).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (37). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (41).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history			
Version	**Date**	**Revised by**	**Changes**
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
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3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory

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2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.

2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.

1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms 'quarantine' and 'isolation'.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

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Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the International Committee on Taxonomy of Viruses manuscript: (https://www.biorxiv.org/content/10.1101/2020.02.07.937862v1.full.pdf)

Contents

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk counselling.

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions.

Contact management

Close contacts of confirmed and probable cases are required to quarantine for 14 days following last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible.

2. The disease

Infectious agents

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

The predominant modes of human-to-human transmission of SARS-CoV-2 is via droplets and fomites from an infected person (3).

There is a gradient from large droplets to very small particles (aerosols), which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures). Certain behaviours, such as singing and shouting, could also increase the force and range of spread of both large and small particles. In poorly ventilated, crowded indoor environments, small particles, which are normally rapidly dispersed may remain suspended or be recirculated for longer periods

There is some evidence that COVID-19 infection may lead to intestinal infection and SARS-CoV-2 can be present in the faeces of infected persons (4). However, to date, there is no evidence of faecal-oral transmission.

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary from between settings and at different time points are dependent on a range of factors, including, public health interventions such as isolation, quarantine and physical distancing to limit close contact between people (5, 6).

Incubation period

Current estimates suggest a median incubation period of 5 to 6 days, with a range of 1 to 14 days (7). The advice in this guideline uses an upper range of 14 days based upon what is currently known about the incubation period for COVID-19. This advice is supported by the literature (8-10), which is informing reviews of this guideline.

Infectious period

The infectious period of COVID-19 is still being determined; however, there are multiple studies suggesting that pre-symptomatic, and possibly asymptomatic, transmission occurs (11, 12). For example, a Singaporean study of multiple case clusters identified pre-symptomatic transmission occurring 1-3 days before symptom onset (13). A recent study also found that viral loads of throat swabs were highest at the time of symptom onset and decreased quickly within 7 days. The study suggested that viral shedding may occur 2 to 3 days before symptom onset with infectiousness peaking at 0.7 days (95% CI, −0.2–2.0 days) prior to initial symptoms (14). Additionally, a Chinese study found that the viral load in an asymptomatic patient was similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (15). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (16), as viral RNA shedding is higher at symptom onset (17).

As a precautionary approach, for the purposes of contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. Confirmed and probable cases are considered to pose a risk of onward transmission and require isolation until criteria listed in the release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia (18), dysgeusia, rhinorrhoea, chills and vomiting. Atypical symptoms of COVID-19 may also occur including chest pain, diarrhoea and conjunctivitis (19-21). Preliminary evidence suggests that children experience milder clinical symptoms than adults (similar to SARS-CoV and MERS-CoV infections) (22-24). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (24, 25). Asymptomatic case rates are difficult to determine because there is no reason for asymptomatic people to seek medical attention. Some studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (26, 27).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.7% (28). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regards to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 26 October 2020, the crude national CFR is 3.3%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Immune response

The immune response, including duration of immunity and duration of antibody response to SARS-CoV-2 infection is yet to be determined. Preliminary evidence suggests IgM and IgG antibody levels to SARS-CoV-2 may wane overtime, however more studies are required to accurately determine the duration of immunity and correlates of protection for COVID-19 (29-31).

Persons at increased risk of exposure

Due to the mode of transmission of COVID-19, people who have frequent, close or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure might include those:

- with a travel history to areas with higher prevalence of COVID-19 through international or domestic travel;
- who care for COVID-19 cases; or
- who have contact with people with a higher likelihood of having active infection.

These groups are predominantly identified through occupational groups and may include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, casual and mobile workers who work across multiple settings (e.g. cleaners, rideshare service and taxi drivers, security personnel) may also be at increased risk of exposure and/or transmission due to factors such as multiple exposure points, work colleagues (who may have a perceived need to continue work despite being unwell), and health messaging challenges for people of culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care settings
- residential aged care settings
- residential care settings
- crowded or high-density housing
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities
- homeless shelters and residential/ crisis hostels
- mining sites, and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health Website (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with exposure to an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 23 August 2020, 219 countries/regions have reported cases, numerous countries/regions have reported broader community transmission, and globally there has been over 23,057,000 confirmed cases and 800,000 deaths (28). The situation is rapidly evolving.

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (32), and declared a pandemic on 12 March 2020 (33).

Australia has implemented measures aimed at slowing the spread of COVID-19 into and within the country, and to prepare healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) provides an overview of the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020. Processes for permanent listing of COVID-19 on the NNDL are currently underway.

On 18 March 2020, the Australian Government declared a “human biosecurity emergency” under the *Biosecurity Act 2015*, given the risks COVID-19 poses to human health and the need to control its spread in Australia. The declaration was recommended by the Chief Medical Officer in his capacity as the Director of Human Biosecurity and allows the state and territory Health Ministers to issue targeted, legally enforceable directions and requirements to combat the virus as required.

3. Routine prevention activities

Travel

Travel restrictions and quarantine requirements have been implemented to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE, avoid contact with sick people, and maintain good personal hygiene.

At present, all individuals returning to Australia from overseas must be quarantined for 14 days after returning to Australia.

Some jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology.

Personal hygiene

Individuals are advised to establish and maintain good hygiene practices. Individuals should:

- Practice good hand hygiene and respiratory hygiene
- Clean frequently touched surfaces regularly with appropriate detergents and disinfectants
- Stay home and not attend public places including work or school if they are unwell

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Physical distancing and gatherings

Physical distancing requirements may be enforced and restrictions have been implemented on public gatherings.

Jurisdictions have implemented restrictions and limitations on individual activities based on local epidemiology to support physical distancing.

All individuals are recommended to:

- Keep a minimum of 1.5m away from others wherever possible
- Avoid physically greeting other people

If individuals are attending public gatherings or venues they should comply with jurisdictional directions including limitations on the number of attendees.

4. Surveillance

There are four main objectives of surveillance for COVID-19:

1. To rapidly identify, isolate and manage cases.
2. To identify, quarantine and provide information to contacts.
3. To rapidly identify and manage clusters and outbreaks.
4. To describe the epidemiology of COVID-19 in Australia to inform public health response including:
    - the progression of the epidemic in time, person and place,
    - transmission dynamics,
    - special risk groups.

5. Communications

Public Health Units (PHU) should, within one working day, notify the central state/territory communicable diseases unit of confirmed cases and COVID-19 deaths upon receipt of a notification/report.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up as soon as possible.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and COVID-19 deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

6. Data management

Initial information on confirmed and probable cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

7. Case definition

The case definition is based on what is currently known about the clinical and epidemiological profile of cases of COVID-19 presenting in Australia and internationally. Health authorities are constantly monitoring the spectrum of clinical symptoms and nature of illness. Using a 14 day exposure period will cover the duration of the incubation period in the vast majority of cases.

Confirmed case

A person who:

i. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

ii. has the virus isolated in cell culture, with PCR confirmation using a validated method;

OR

iii. undergoes a seroconversion to or has a significant rise in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Probable case

A person who has detection of SARS-CoV-2 neutralising or IgG antibody[1] **AND** has had a compatible clinical illness **AND** meets one or more of the epidemiological criteria outlined in the suspect case definition (see below).

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical criteria:

Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological criteria:

In the 14 days prior to illness onset:

- Close contact[5,6] (refer to Contact definition below) with a confirmed or probable case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[7]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] If the person is a close contact of a probable case, at least one person in the chain of transmission must be a confirmed case.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] Testing household contacts of confirmed or probable cases of COVID-19 may not be indicated where resources are constrained. These cases would be considered 'probable cases' (refer to definition above).

[6] In certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak. For further information, refer to outbreak investigation and management in high-risk settings.

[7] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

It is recognised that without any other epidemiological risk factors, the risk of persons having COVID-19 is low. Any person with symptoms clinically compatible with COVID-19 who is tested should stay at home until a negative test is returned or symptoms have resolved, whichever is longer. If a person receives a PCR positive test result, they are a confirmed case and must isolate until they meet the appropriate release from isolation criteria. Asymptomatic persons tested as a part of screening at workplaces or borders are not required to stay home until a negative test result is returned, unless advised by PHU or relevant jurisdictional authorities.

Given the low pre-test probability of community members without any epidemiological risk factors, persons tested as part of enhanced testing do not need to be re-tested during the same illness if their first result is negative. Clinical judgment should be exercised when considering retesting.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix D.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). They will do this on day 0–2 and then on day 10–12 of hotel quarantine, with results to be received prior to the end of the quarantine period. Exact arrangements will depend on states and territories. Jurisdictions may also test asymptomatic persons who are quarantined due to interstate travel. For further information, see Contact management – returned travellers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

8. Laboratory testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed, probable, or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply. If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* (https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidance-on-use-of-personal-protective-equipment-ppe-in-non-inpatient-health-care-settings-during-the-covid-19-outbreak)

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.

- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Collection of upper respiratory samples from asymptomatic members of the public for surveillance purposes

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations but this is a guide:

- Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or feverishness?" and record the response.
- If the person has any symptoms, follow the infection prevention and control precautions above.
- If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in the current context of low or negligible community transmission of COVID-19.
- Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix A. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Approach to testing and specimen collection

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

For advice on selecting the appropriate specimen for diagnostic reverse transcriptase – polymerase chain reaction (RT-PCR) testing for COVID-19, refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

RT-PCR of respiratory tract samples (see PHLN guidance on laboratory testing for SARS-CoV-2) remains the gold standard for diagnostic testing for COVID-19. New methods for specimen collection such as saliva samples are being investigated. Other tests for presence of antigen or antibodies may have regulatory or legal restrictions in place. Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for additional information prior to use.

Laboratory-based serology tests can help identify individuals who have developed detectable antibodies as part of an immune response to SARS-CoV-2. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection.

Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Some jurisdictions have demonstrated significant benefits of using SARS-CoV-2 genomics to inform their public health response. Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for further information.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2. In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. Public Health Units (PHUs) should consider this in low prevalence settings, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results. The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for URTI viral pathogens. If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify ‘potential source contacts’.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be taken into account. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

9. Case management

Response times

On the same day as notification of a confirmed, probable, or suspect case, begin follow up investigation and, where applicable, notify your central state or territory communicable diseases unit.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case, and be guided by the COVID-19 PHU checklist (Appendix B) and the COVID-19 investigation form (currently pending).

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing and determine if the case has attended settings that are at higher risk for infection.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly useful to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the first reported case or index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should also be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that contacts will be identified as both close contacts and potential source contacts, and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the first reported case (or index case if an outbreak), a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. A thorough investigation of the past 3 months should be conducted to determine if the individual has recently had symptoms that are clinically compatible with COVID-19, or an epidemiological link can be identified. If historical symptoms are identified, then for the purposes of contact tracing, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset.
3. If no historical symptoms are identified, then for the purposes of contact tracing, the case is considered to have been infectious for 48 hours prior to the initial positive test.
4. Regardless of whether historical symptoms have been identified, follow the case prospectively for 10 days, where feasible, after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and; appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate and trace close contacts.

A risk assessment should be undertaken for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Laboratory testing section and PHLN guidance on laboratory testing for SARS-CoV-2) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result, though should stay home until symptoms have resolved. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14 day period, regardless of any negative test results. Refer to Contact management for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed, probable, or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures, and in other specified clinical circumstances.** Refer to Appendix A for further information.

Note that, consistent with Infection Control Expert Group guidance, previous advice on the use of airborne precautions for care of patients with severe cough has been withdrawn.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the confirmed or suspect case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated isolation area that is separate from other patient areas and is not used as a thoroughfare, OR
        - at minimum be directed to a single room with the door closed for an aerosol-generating procedure, OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or well-ventilated operating or procedure room).

If transfer outside of the room or designated isolation area is necessary, the patient should wear a surgical mask during transfer, if their condition allows. Patients should be reminded of the importance of respiratory hygiene and cough etiquette at all times. Patients requiring oxygen therapy should be transitioned to nasal prongs where medically possible and wear a surgical mask.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Appendix A.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019).

Release from isolation

The following information details the circumstances under which confirmed cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2]

   b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

   The case can be released from isolation if they meet both of the following criteria[2]:

   - at least 20 days have passed since the onset of symptoms; and
   - the case is not significantly immunocompromised[4]

   OR

   The case can also be released from isolation if they meet all the following criteria:

   - at least 14 days have passed since the onset of symptoms;
   - there has been substantial improvement in respiratory symptoms of the acute illness (including resolution of fever for the previous 72 hours)[1]; and
   - the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (34, 35). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings.

This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is **not** necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and HCWs should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.

- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Appendix B.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or suspected COVID-19 patients. Examples of AGPs include bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

Particulate filter respirators (PFRs), such as P2 or N95 respirators, should be used only when required. Unless used correctly, i.e. with fit-checking, protection against airborne pathogen transmission will be compromised.

Note: For aerosol-generating procedures performed in areas with low or no community transmission, on patients who are NOT suspected or confirmed cases of COVID-19, PFRs are not required, i.e., a surgical mask is appropriate.

PFRs should also be considered in preference to a surgical mask in certain specified clinical settings. For further information, see the Infection Control Expert Group guidance on the use of personal protective equipment in hospitals during the COVID-19 outbreak.

The Laboratory testing section provides detailed information on sample collection for SARS-CoV-2.

Active case finding

Contacts (refer to Contact management section) should be identified and advised to immediately seek medical advice should they develop symptoms. Contacts or caregivers should be asked to also inform the public health agency if they develop symptoms.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

10. Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals it may be appropriate to consult with animal health authorities.

11. Contact management

Identification of contacts

Persons categorised as close contacts (refer to definition of "close contacts" below) of a confirmed or probable case should be followed-up, provided with information, and are required to self-quarantine at home for 14 days following the last close contact with the case whilst infectious. Close contacts should be monitored for the development of symptoms for 14 days after the last exposure to the infectious case (i.e. the maximum incubation period) where feasible to do so.

Contacts of suspect cases should also be considered for contact management if there is likely to be a delay in confirming or excluding COVID-19 in the suspect case, such as delayed testing.

Less frequent active follow-up together with passive surveillance may be necessary if there are large numbers of close contacts to monitor.

Contacts who do not meet the close contact definition but may have had some exposure to the infectious case (e.g. workplaces) should be identified and provided information (refer to Education below), where feasible.

Close contact definition

A close contact is defined as requiring:

- face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case, or
- sharing of a closed space with a confirmed or probable case for a prolonged period (e.g. more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case.

For the purposes of surveillance, a close contact includes a person meeting any of the following criteria:

- Living in the same household or household-like setting (e.g. in a boarding school or hostel) – referred to as 'household contacts'.
- Direct contact with the body fluids or laboratory specimens of a case without recommended PPE or failure of PPE.
- A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility). Refer to Special situations for further information specific to aged care facilities and schools.
- A person in the same hospital room when an aerosol-generating procedure is undertaken on the case, without recommended PPE.

- Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed or probable COVID-19 case. Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.
- For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts. Refer to Special situations and Appendix C for further information.
- If an aircraft crewmember is the COVID-19 case, contact tracing efforts should concentrate on passengers seated in the area where the crewmember was working during the flight and all of the other members of the crew. A case by case risk assessment should be conducted to identify which passengers and crew members should be managed as close contacts. Refer to Special situations and Appendix C for further information.
- Close contacts on cruise ships can be difficult to identify, and a case-by-case risk assessment should be conducted to identify which passengers and crew should be managed as close contacts. Refer to Special situations for further information.

Contact needs to have occurred within the period extending 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for a symptomatic confirmed or probable COVID-19 cases are not considered to be close contacts.
- Contact tracing is not required for close contacts arriving on international flights on or after 16 March 2020.
- At the discretion of PHU, the definition of a close contact may be expanded to include a broader range of contacts. This may be relevant where there has been evidence of transmission in a particular circumstance or setting. For example, when transmission is identified in people who have attended the same venue as a confirmed case (e.g. restaurant, pub, place of worship) but have not had close contact with the case.
- Although it has been shown that transmission can occur up to 72 hours prior to symptom onset, in most circumstances there is marginal benefit in identifying close contacts exposed beyond 48 hours prior to symptom onset. In some high-risk settings, public health units may opt for a more precautionary approach and use a time period of 72 hours prior to symptom onset in the case (or first positive PCR test if the case is asymptomatic) when identifying close contacts.

Returned traveller definition

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Contact assessment

All persons identified as having had contact with a confirmed or probable case should be assessed to see if they should be classified as a close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Identification and assessment of the contacts of suspect cases may be deferred pending the results of initial laboratory testing.

Close contact testing

Routine laboratory screening for COVID-19 is not recommended for asymptomatic close contacts; however, in certain high risk outbreak settings, PHU may consider testing asymptomatic contacts to inform management of the outbreak.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Other contacts not defined as close contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet.

Quarantine and restriction

Close contacts

Asymptomatic close contacts are required to self-quarantine at home for 14 days following the last contact with the infectious case, and should be advised to monitor their health for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Where feasible to do so, PHU should conduct active daily monitoring of close contacts for symptoms for 14 days after the last possible contact with a confirmed or probable COVID-19 case.

Self-quarantined close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

For the purpose of contact management, swabs are **not** currently mandatory during quarantine in well people. A medical clearance from a health care provider is not required for release from quarantine or for other purposes such as returning to work, school or university.

Jurisdictional communicable disease authorities or PHUs may consider testing during the quarantine period:

- Entry testing – a positive test result would support a decision to move the person to an alternative place of quarantine where household quarantine is not ideal, and would also bring forward contact tracing for that person. This is particularly important to consider if the contact is associated with a high-risk setting.
- Exit testing – finding a positive test result late in the quarantine period (day 10–12) of a close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community. Again, this is particularly important to consider if the contact is associated with a high-risk setting.

Returned travellers

All travellers who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care, refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others if they become unwell. This advice should be followed for 14 days after returning to Australia/from interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Physical distancing

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to generally reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace is aimed at nonessential activities and includes:

- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when out and about in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine space (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine. This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should vigilantly practise physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals under self-quarantine need to see a doctor for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should **telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19.** If the patient has **symptoms consistent with the COVID-19** case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting. Contact and droplet precautions are recommended for routine care of patients in quarantine.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed or probable COVID-19 case.

12. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts needs to be considered.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

High-risk settings – steps in investigation

There are several initial steps that public health unit staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, congregate disability accommodation, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

4. Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

5. Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

6. Collate information.

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

7. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

8. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

9. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

10. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

11. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actio	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

13. Special risk settings

Healthcare workers

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to section 6. Contact Management).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed, probable, and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Healthcare worker exposures in the context of PPE use

Where the healthcare worker (HCW) and/or case are using PPE, a risk assessment should be performed to determine whether the contact should be designated as a close contact and quarantined for 14 days (see Tables 2a and 2b). Factors that may be considered include:

- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, wandering).

- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Note: exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, public health units may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Continue to work • HCW to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the HCW, and return of a negative result, prior to continuation of work.

Contact tracing in high-risk settings

In high risk settings, an aggressive and proactive approach to contact tracing is required. As a starting position, all staff on the same or overlapping shifts should be regarded as potentially at risk requiring assessment. Potential sources of information might include shift rosters, patient allocation lists, patient documentation, and tea room logs, in addition to interviews with the case and potential contacts. In healthcare settings, it is important to consider all staff groups who may have been present – medical, nursing, allied health, paramedics, pharmacy, cleaners, pastoral care, security, contractors, students and visitors. In addition to face-to-face contact during the course of patient care, other settings such as tea rooms, shared work areas, changing rooms and bathrooms should be considered as potential locations where transmission may occur.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.

- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.
- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Aged care facilities

Aged care facilities are high-risk settings for infectious disease outbreaks. This is because there is often high density living with extensive close physical contact between staff and residents during the provision of care. Residents are at increased risk of severe illness and death due to their age and presence of co-morbid conditions. There are often many visitors, volunteers and staff moving between the community and facilities, which can promote the spread of infectious diseases.

Residents of aged care facilities who require testing for SARS-CoV-2 should be tested on site, where feasible.

Preventative measures

In addition to usual preventative protocols, aged care facilities should ensure that high rates of influenza vaccination are maintained amongst all occupants and staff. Messaging to discourage unwell visitors from visiting facilities and occupants should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition. Visitors, residents and staff should be encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette.

Outbreaks

The vast majority of aged care facilities should have frameworks and protocols for testing and isolation in the event of respiratory disease outbreaks.

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible. If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged. Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place.

Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

People with disability

Some people with disability will be at greater risk throughout the COVID-19 pandemic. This is due to:

- Risk of more serious illness if infected by COVID-19.
    - There is a high prevalence of comorbidities amongst people with disability, including chronic conditions and weakened immune systems.
    - Additionally, people with disabilities can have unrecognised, untreated or poorly managed physical or mental health conditions.
- Challenges involved in preventative measures.
    - Physical distancing can also be difficult or impossible for some people with disability. This includes those who rely on support and assistance from family members, carers and support workers.
    - Some people with disability also face barriers to implementing basic hygiene measures and safely wearing face masks. These factors put many people with disability and those that support them at higher potential risk of exposure to the virus.
    - Barriers to adequate deep nasal swabs for PCR.

Some people with disability live at home by themselves, others live with family members, or in congregate disability accommodation such as group homes or larger facilities.

Congregate disability accommodation settings are high-risk settings for infectious disease outbreaks due to higher density living, close physical contact between staff and participants, and large number of visitors and staff moving between the community and facilities. Such settings require increased levels of risk mitigation and support to prevent COVID-19 transmission.

Preventative measures

In addition to usual preventative protocols, congregate disability accommodation should ensure that people with disability and support staff are encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette. Consideration should be given to the communication and support needs of the person with disability, and reasonable adjustments should be made as required. Information should be provided in accessible formats such as Easy Read and Auslan.

Messaging to discourage unwell visitors from visiting people with disability in congregate accommodation should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition.

Outbreaks

Outbreaks of COVID-19 in congregate disability accommodation settings should be managed with reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities. The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia, noting that a supplementary appendix is currently being drafted to address the specific needs of smaller residential care homes or congregate disability accommodation settings.

Hotel quarantine workers

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. The risk of exposure should be determined by those managing the quarantine/isolation setting (e.g. a Public Health Unit).

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers, ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may also determine appropriate methods for routine testing, which may include alternative testing methods (e.g. saliva).

Please see AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

14. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed, probable or suspect cases

If confirmed, probable or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed, probable and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed or probable cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed or probable case
- Duration of exposure to confirmed or probable case
- Size of the compartment in which the crew member and confirmed or probable case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact.

For further information, refer to Appendix C: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances **where all alternative surge workforce strategies are exhausted** and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (36). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).

iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.

iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).

v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Appendix B: PHU checklist

Appendix C: Risk assessment and identification of close contacts in aircrew

Appendix D: Information for donor and transplant professionals

Appendix A: Guidance on the minimum recommendations for the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak

Note: This appendix is a copy of ICEG guidance and will be updated as ICEG publishes revisions to their advice; however, there may a delay in updates being reflected in this appendix. The most recent version of this guidance is available at: https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak

Background

This document was developed by the Infection Control Expert Group (ICEG) and endorsed by the Australian Health Protection Principal Committee (AHPPC). It provides guidance on the use of personal protective equipment (PPE) in hospital settings, including the birth suite, during the COVID-19 outbreak. For additional guidance on infection prevention and control during the COVID-19 pandemic, see the Department of Health website.

As a national document, the guidance on PPE contained in this document, should be considered as the **minimum**. This advice is continually reviewed as the situation changes and new evidence about COVID-19 becomes available. Check with your state or territory health department for additional specific advice for your jurisdiction.

In geographical areas with significant community transmission of COVID-19 (as defined by jurisdictional public health units) or, in specified clinical settings, health care workers and others deemed potentially at risk of transmission, may need to take extra precautions. This may include precautions *above those usually indicated for standard and transmission-based precautions*. See ICEG guidelines on PPE in areas with significant community transmission for more information.

All PPE should be used in line with the principles in the Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019), whilst acknowledging the unique circumstance of COVID-19 and requirements for additional PPE in some circumstances.

For current COVID-19 case definitions and testing criteria see above.

Guidance on the use of PPE in non-inpatient health care settings during the COVID-19 outbreak and further supporting information on the use of masks and respirators in the context of COVID-19 are also available.

In areas with no or low community transmission: for clinical care of patients who are NOT suspected or confirmed COVID-19 cases*, standard infection prevention and control precautions — including use of PPE, if required — should be observed as usual.

In areas with significant community transmission: surgical masks should be used for all routine clinical encounters (not just for suspected or confirmed cases); and particulate filter respirators (PFRs) should be used in some settings or scenarios. See here for details.**

*Case definitions are outlined above

**Health care workers who use PFRs, such as P2 or N95 respirators, must be trained in their correct use, including how to perform fit-checking at donning, and safe removal. Men must be clean shaven to achieve a good seal on the face. Unless PFRs are used correctly, their effectiveness will be compromised and the risk of infection (to the wearer) increased.

CURRENT EVIDENCE

Extensive evidence, particularly from China, Canada, Taiwan, Singapore, and Hong Kong, indicates that the application of recommended infection prevention and control measures including administrative, engineering, environmental controls, and protective measures during patient care, have almost completely prevented occupational acquisition of COVID-19 (1-7).

The following advice is based on evidence-informed literature and expert opinion.

- **Asymptomatic COVID-19 infection is** estimated to occur in 20% of people who become infected with SARS-CoV-2 (95% CI 17-25, systematic review of 79 studies) (8). Although transmission is well described, it is likely to be significantly less than from a person with symptomatic infection (9). It can occur at any age. However, the prevalence of asymptomatic vs pre-symptomatic transmission may be overestimated because of limited or no follow-up in some studies.
- **Presymptomatic transmission** is well documented. The duration of infectivity before the onset of symptoms is uncertain but evidence suggests viral load may be highest around the day of symptom onset (9).
- Viral RNA load declines in the second week of illness. Viable (cultivable) virus can rarely be recovered from the respiratory tract for more than 8 days after symptom onset. Viral RNA may be detected by PCR for much longer but is unlikely to represent viable virus as specimens are rarely culture positive and secondary transmission from late PCR-positive cases is rarely observed.
- A large range of epidemiological evidence confirms that, like most respiratory viral infections, **COVID-19 is predominantly transmitted by large droplets** (>10 µm).
- Activities such as shouting, singing and coughing, especially in in an enclosed, poorly ventilated space, can increase the amount of droplet production and range of droplet dispersal. Therefore the risk of transmission may be increased due to incorrect use of PPE and/or environmental contamination.
- Airborne transmission (via aerosols of small particles) is believed, by most authorities, to be rare, except possibly in association with aerosol-generating behaviours and some high-risk aerosol-generating procedures.

For a more extensive review of the evidence, see the ICEG review, Use of masks and respirators in the context of COVID-19.

General guidance on minimum PPE for the care of patients who ARE suspected or confirmed COVID-19 cases

2.1 Care of patients with acute respiratory symptoms or suspected or confirmed COVID-19

- Standard precautions, respiratory hygiene, cough etiquette and physical distancing apply, as for all patients.
- Patients with acute respiratory symptoms and/or who are suspected cases of COVID-19 should be asked to wear a surgical mask upon presentation to hospital or other healthcare setting e.g. clinic.
- Patients should be placed in a single room with the door closed, or, if this is not available place in a physically separated, designated isolation area that is separate from other patient areas and is not used as a thoroughfare.
- The minimum requirement for an aerosol generating procedure (AGP) on a patient with suspected or confirmed COVID-19, is a single room with the door closed.
- However, if possible, a high-risk AGP (see page 8) should be performed in a negative pressure room or well-ventilated operating or procedure room.

If transfer outside of the room or designated isolation area is necessary, the patient should wear a surgical mask during transfer, if their condition allows. Patients should be reminded of the importance of respiratory hygiene and cough etiquette at all times. Patients requiring oxygen therapy should be transitioned to nasal prongs where medically possible and wear a surgical mask.

2.2 Environmental hygiene

In addition to routine cleaning, frequently touched surfaces and equipment should be cleaned frequently, preferably after each use, or whenever visibly soiled. Use a detergent/disinfectant wipe or a detergent product, with disposable or laundry-safe cloth. Refer to the manufacturer's instructions regarding the disinfectant used.

Advice on environmental cleaning and disinfection for health and residential care facilities is available on the Department of Health website.

2.3 Transmission-based precautions

- **Contact[4] and droplet[5] precautions** should be used for the routine care of suspected or confirmed cases of COVID-19**.**
- **Contact and airborne[6] precautions** should be used for the care of suspected or confirmed cases of COVID-19 in specified circumstances:
    - When performing AGPs (see 2.4, see below).
    - In other specified clinical circumstances (see Contact and airborne precautions, and 3.4 below).

There is strong clinical and epidemiological evidence that the predominant mode of spread of COVID-19 is via **respiratory droplets** (produced during speaking, coughing, sneezing etc.):

- **Directly** during close face-to-face contact (within ~1.5 m) by exposure of the face (and then mucosae of mouth, nose or eyes) OR
- **Indirectly** by touching surfaces or fomites contaminated by respiratory droplets and then touching the face.

Contact and droplet precautions: PPE for use in routine care of patients with suspected or confirmed COVID-19

The following PPE should be put on (donned) before entering the patient's room:

- **Gown / Aprons**
    - Long-sleeved, preferably fluid-resistant, **gown or apron.**
    - A launderable cloth gown or apron is adequate when direct physical contact is minimal and/or the risk of blood or body splash is low (e.g. observations, medication delivery)
- **Surgical mask**
    - Varying levels of fluid resistant surgical masks are available.

[4] See https://www.safetyandquality.gov.au/publications-and-resources/resource-library/approach-1-contact-standard-precautions-photo
[5] See https://www.safetyandquality.gov.au/publications-and-resources/resource-library/approach-2-droplet-standard-precautions-icon
[6] See https://www.safetyandquality.gov.au/publications-and-resources/resource-library/approach-1-airborne-standard-precautions-photo

  - When the likelihood of exposure to blood or body fluid is low, in routine care, a level 1 surgical mask is acceptable. Level 2 or 3 masks should be used when there is a risk of blood or body fluid exposure and in the operating theatre.[7]

- **Eye protection**
  - Face shield, wrap-around safety glasses, visor or goggles. Note prescription glasses do not represent safety eye wear and additional eye protection is recommended.
- **Gloves**
  - Disposable non-sterile **gloves** when in direct contact with patient (use hand hygiene before donning and after removing gloves)
- **Boot/Shoe Covers**
  - Use of boots or shoe covers is not recommended unless gross contamination is anticipated or required as standard attire in operating theatre or trauma room.
- **Head Covers**
  - Long hair should be securely tied back.
  - A head covering is not required except as part of standard operating theatre attire or when performing a sterile/aseptic procedure (e.g. central line insertion). A head covering may be used to contain hair or for comfort reasons (e.g. to form a barrier for straps from masks or face shields).

NOTE: As per Australasian Institute of Clinical Governance (AICG) artificial nails and jewellery that interferes with the safe use and correct donning and doffing PPE should be removed.

Care should be taken to avoid self-contamination when removing (doffing) PPE.

The **principle** is to avoid contamination of clothing, skin or mucous membranes (including the eyes) with potentially contaminated PPE. Do not touch the front of the gown, eye protection or mask and perform hand hygiene between steps.

The following sequence is recommended and safe but alternative sequences can be performed safely.

- Remove gloves without touching the outside of the glove and perform hand hygiene
- Remove gown/apron, without touching the front of the gown, by folding it so that the external (exposed) side is inside; perform hand hygiene
- Remove eye protection, perform hand hygiene and then remove your mask by the ties or ear loops, and perform hand hygiene.
- Eye protection and mask should be removed outside, of the patient's room. Local jurisdictional regulations for waste disposal should be followed.

Only PPE marked as reusable should be reused and then only after decontamination and reprocessing according to the manufacturer's instructions. All other PPE must be disposed of appropriately after use.

Contact and airborne precautions: Use of PPE in specific patient groups with suspected or confirmed COVID-19

The only modification for **airborne precautions,** is the requirement for use of a **particle filter respirator** (PFR), such as a P2 or N95 respirator, instead of a surgical mask. All other components of standard and contact precautions remain the same.

[7] See ICEG guidance on the use of face masks and respirators in the context of COVID-19.

Principles of use of PFRs in COVID-19

- PFRs are required in the context of AGPs and AGBs and other specified circumstances (see sections 2.3, 2.4, 3.1, 3.2, 3.3 and 3.4).
- Health care workers who use PFRs should be trained in their correct use, including how to perform fit-checking and safe removal. Note some jurisdictions have fit testing requirements and programs, refer to local policies Australian standards.
- Unless PFRs are used correctly, protection against airborne pathogen transmission will be compromised (refer to information about correct use as below).

Fit-checking is the minimum standard for each occasion of use of a PFR.

- Fit-checking ensures the respirator fits the user's face snugly (i.e. creates a seal) to minimise the number of particles that can bypass the filter through gaps between the user's skin and the respirator seal.
- An airtight protective seal is difficult to achieve in the presence of facial hair that underlies the edge of the PFR. The face must be smooth and/or clean-shaven to achieve a good air tight seal. Facial hair should be removed or an alternative type of PFR, such as a powered air-purifying respirator (PAPR) considered (see below).
- A range of types and sizes of PFR may need to be fit-checked to find one that achieves a protective seal (i.e. passes fit-check). If a suitable PFR cannot be found an alternative (e.g. PAPR) should be considered.
- For further information on fit-testing, see the ICEG guidance on the use of face masks and respirators in the context of COVID-19.

Fit-testing is defined in the Australian/New Zealand Standard 1715:2009, is a validated method for matching PFRs with an individual's facial shape, but has not been widely applied in Australia. Despite increased awareness and demand, in the context of COVID-19, fit-testing of all health care workers, who may need to use a PFR, will be difficult to accomplish due to limited supplies and range of types/sizes available.

NOTE: Fit-testing does not guarantee that a respirator will not leak, particularly if a different type or size is used to one previously fit-tested. This reinforces the need to fit-check each time a respirator is used.

Transmission-based precautions, as outlined – including appropriate use of PFRs – will provide high level protection of health care workers caring for patients with suspected or confirmed COVID-19.

Powered Air Purifying respirators (PAPRs)

- PAPRs are an alternative to PFRs that may be considered in selected circumstances e.g. when the fit of a PFR is compromised or when extended use of a PFR is required see below*.
- A number of different types of relatively lightweight, comfortable PAPRs are available.
- The use of a PAPR does not provide any additional protection compared to a well-sealed PFR.
- PAPRs should only be used by health care workers trained in their use, including safe application and removal using the correct sequence; the respirator is last item of PPE to be removed.
- PAPRs should be used according to the manufacturer's instructions including battery use, filter position, reprocessing of re-usable components etc.
- If a health care worker is required to remain in the patient's room continuously for a long period to perform multiple AGPs (e.g. for more than one hour), the use of a PAPR may be considered for additional comfort and visibility.

- PAPRs used during sterile procedures should be suitable for use to maintain sterile field.
- PAPRs designed for use in settings outside of healthcare are not recommended.
- Manufacturer's instructions for reprocessing of reusable PAPR components and management of filters, should strictly be followed.

Training and care is required with removal of a PAPR, incorrect removal can be associated with an increased risk of self-contamination. In some situations the use of an additional person (wearing appropriate PPE) can assist in the guidance and supervision during the doffing sequence.

2.4 Aerosol-generating procedures

Some **AGPs** performed during the care of patients with suspected or confirmed COVID-19, may be associated with an increased risk of transmission. The following ***examples*** are illustrative of a range of high-risk AGPs.

Instrumentation or surgical procedures on the respiratory tract

- Insertion or removal of an endotracheal tube and related procedures (e.g. manual ventilation and open suctioning of the respiratory tract).
- Bronchoscopy and upper airway procedures that involve open suctioning.
- Tracheotomy/tracheostomy (insertion, removal, open suctioning).
- Ear-nose-throat, faciomaxillary or transphenoidal surgery; thoracic surgery involving the lung.
- Post-mortem procedures involving high speed devices on the respiratory tract.
- Intentional or inadvertent disconnection/reconnection of closed ventilator circuit and/or suctioning.

Other procedures that generate respiratory aerosols

- Manual or non-invasive ventilation (NIV): bi-level positive airway pressure ventilation (biPAP); continuous positive airway pressure ventilation (CPAP).
- Collection of induced sputum.
- High flow nasal oxygen.
- Upper gastrointestinal instrumentation that involves open suctioning of upper respiratory tract.
- Some dental procedures (e.g. involving high speed drilling).

Cardiopulmonary resuscitation is a special circumstance

- Because it is an emergency, life-saving procedure, special consideration is warranted for cardiopulmonary resuscitation (CPR).
- A systematic review[8] of AGPs showed that CPR was a high-risk procedure, associated with an increased risk of transmission of SARS.
- **However, neither chest compression nor defibrillation, alone, was associated with increased risk unless accompanied by intubation.**
- Contact and droplet precautions are the minimum protection required in the context of CPR of a patient with suspected or confirmed COVID-19. A healthcare worker using contact and droplet precautions can commence defibrillation or chest compressions. However, some hospitals may recommend airborne precautions prior to commencement of chest compressions, if feasible.
- **Delay in the commencement of chest compressions should be avoided.**
- **A PFR should be used for active airway management procedures.**

[8] Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012;7(4):e35797.

In the context of low or no community transmission of COVID-19, chest compression and defibrillation are unlikely to pose a risk to first responders or bystanders who commence CPR without knowledge of the subject's COVID-19 status.

Other specified settings in which a PFR should be used

- **PFRs** should be considered in preference to a surgical mask for the care of *suspected or confirmed cases*, in emergency departments, residential care facilities, or *in-patient settings where one or both of the following apply:*
    - For the clinical care of *patients with suspected or confirmed COVID-19 who have cognitive impairment, are unable to cooperate or exhibiting challenging behaviours.*[9]
    - Where there are *high numbers of suspected or confirmed COVID-19 patients AND a risk of challenging behaviours and/or unplanned aerosol-generating procedures*.
    - Settings where there are a high density of COVID-infected patients, particularly in wards or cohorted areas without optimal ventilation and where prolonged episodes of care are required.
- See here for further detail.

Use of PPE for the care of suspected or confirmed cases in specific hospital settings

3.1 Intensive care unit (ICU)

- **Contact and droplet** precautions are minimum protection required for routine care of patients in ICU, who have suspected or confirmed cases of COVID-19, and who:
    - are not ventilated (either invasive or non-invasive), nor on CPAP nor requiring High Flow Nasal Prong (HFNP) regular nebulisers.
    - are intubated with a closed ventilator circuit, from which the risk of airborne transmission is minimal. However, during routine care when the circuit is opened (e.g. to change a heat-moisture exchanger) or if risk assessment indicates that inadvertent disconnection of the ventilator circuit may occur, use of a PFR should be considered.
- Contact and **airborne** precautions, including a PFR, should be used for care of COVID-19 patients in ICU requiring AGPs.
- If a health care worker is required to remain in an ICU patient's room for a long period (e.g. more than one hour) to perform multiple AGPs, the use of a PAPR may be considered, as an alternative, for greater comfort and visibility.

ICU staff caring for patients with COVID-19 (or any other potentially serious infectious disease) should be trained in the correct use of PPE, including the use of a PFR and PAPR, by an infection prevention and control professional or other suitably qualified educator.

[9] There is an increased risk associated with challenging behaviours, such as shouting, by patients who find instructions – to wear a mask or practice respiratory/cough etiquette – hard to follow (e.g. secondary to cognitive impairment or mental illness), especially in the first week of infection, when viral load may be high.

3.2 Wards, including care of critically ill patients outside of the ICU setting, e.g. general wards, COVID wards and emergency departments

- At a minimum contact and **droplet** precautions (including the use of a PFR) should be used for the care of COVID-19 patients with suspected or confirmed COVID-19 in general wards, dedicated COVID-19 wards, other in-patient settings, and emergency departments.
- Contact and **airborne** precautions should be used for care of COVID-19 patients with suspected or confirmed COVID-19 when one or more of the following apply:
    - When performing an AGP
        - AGPs should be performed in a negative pressure room (or a standard isolation room with door closed)
        - the number of persons present in the room should be minimised
    - For the clinical care of patients who have cognitive impairment, are unable to cooperate, or exhibit challenging behaviours (such as shouting).
    - Where there are high numbers of COVID-19 patients AND a risk of challenging behaviours and/or unplanned aerosol-generating procedures

3.3 Operating suite

NOTE: For procedures performed on patients in an operating suite who are NOT suspected or confirmed cases of COVID-19, the usual surgical PPE for the clinical circumstances should be used, i.e., surgical mask, theatre cap, gown, gloves, eye protection.

Routine infection prevention and control principles should be strictly adhered to during surgery, including avoidance of unnecessary entry and exit from the operating theatre during surgery.

The number of people in the theatre should be limited to those required for clinical or educational purposes.

- Surgical procedures for patients with suspected or confirmed COVID-19 should be performed only in an emergency or deemed medically essential.

Separate guidelines are available for use of PPE by anaesthetic and surgical staff during elective surgery for patients with suspected or confirmed COVID-19[10].

The same general principles apply as outlined above:

- **Standard precautions** apply to the care of all patients, including use of PPE based on risk assessment
- **Contact** and **droplet** precautions for anaesthetic or surgical procedures not involving AGPs in patients with suspected or confirmed COVID-19
- **Contact and airborne** precautions for anaesthetic or surgical procedures involving AGPs with suspected or confirmed COVID-19

NOTE: Intubation is considered an AGP – refer to section 2.5.

[10] See https://www.safetyandquality.gov.au/publications-and-resources/resource-library/covid-19-elective-surgery-and-infection-prevention-and-control-precautions

3.4 Birth suite

For care of a pregnant woman, with suspected or confirmed COVID-19, during labour:

- The woman should be asked to wear a surgical mask, if tolerated
- The number of staff in attendance should be reduced to a minimum.

For clinical staff caring for a woman with confirmed COVID-19 during labour:

- **Contact and droplet precautions**, including a surgical mask and eye protection, should be observed by all labour ward staff, in addition to standard precautions.
- **A PFR** should be worn by staff who have prolonged, close contact with the woman, during established labour and vaginal delivery.

PFR use in specified clinical settings:

- There is anecdotal evidence of a link between health care worker infection and challenging behaviour, such as shouting, by patients who are agitated or find instructions hard to follow, especially during the first week of infection, when viral load may be high.
- The risk of health care worker infection seems to increase when there is prolonged patient contact.
- However, it is not clear whether any increased risk reflects enhanced infection potential from greater dispersal of droplets and/or heavy environmental contamination or aerosolisation due to increased vocal/respiratory activity such as shouting.
- It is also not clear that the use of a PFR will reduce the risk.

The woman's partner **or** other support person (one only) may attend the delivery even if s/he is in quarantine[11]. Precautions required to protect labour ward staff include:

- Communication should occur between the birthing mother, birth partner and hospital to assess risk and provide risk mitigation strategies.
- On entering the hospital, the partner/support person should: perform hand hygiene and put on surgical mask (to protect others); in the labour ward put on a gown and other PPE as required (to protect clothes from blood/liquor).
- During the delivery, it is likely to be safer if the partner/support person moves to stand to the side of the woman and out of direct line of the mouth.
- On leaving the labour ward, the partner/support person should remove gown and perform hand hygiene; perform hand hygiene and remove mask (if not in quarantine) when leaving premises.
- If the partner is in quarantine as a close contact, s/he should observe precautions as instructed by the public health unit and wear a mask until reaching home.
- **A birth support person with acute respiratory or other symptoms consistent with COVID-19 should not attend the delivery.**

For patients with suspected COVID-19, a risk assessment should be undertaken to determine the appropriate level of PPE required during labour and delivery

[11] Quarantine is required for someone who has had close contact with a potential or confirmed case, recent overseas travel or other exposure in the last 14 days but who remains asymptomatic.

General guidance on care of patients who are NOT suspected or confirmed COVID-19 cases in areas with LOW or NO community transmission

In areas with low or no community transmission, PPE for the care of inpatients who are NOT suspected or confirmed cases of COVID-19, should be used in accordance with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019).*[12]

Standard precautions are required for all patients regardless of known COVID-19 status, including hand hygiene and risk assessment, to determine the level of PPE required, if any.

Respiratory hygiene and cough etiquette must be observed at all times.

Physical distancing during the COVID-19 outbreak: health care staff should stay at least 1.5 m away from other people including:

- patients (except when unavoidable, e.g. during physical examination/care), AND
- members of the public, hospital visitors and other staff (e.g. in wards, clinics and nonclinical areas such as during meetings, in offices and shared workplaces and during tea breaks etc.).

AGPs performed on non-COVID-19 patients

In areas with low or no community transmission, standard precautions, in addition to PPE appropriate for the procedure and setting (e.g. operating theatre), are adequate for the performance of AGPs on patients who are not suspected or confirmed cases of COVID-19, unless another infection that is known to be airborne, such as tuberculosis, is suspected. A gown, surgical mask, eye protection gloves (and head covering if required as regular theatre attire) would typically be worn.

Where can I get more information?

For the latest advice, information and resources go to the Department of Health website

Call the National Coronavirus Health Information Line on 1800 020 080. The line operates 24 hours a day, seven days a week. If you require translating or interpreting services, call 131 450.

The telephone number of your state or territory public health authority is available on the coronavirus page on the Department of Health website.

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[12] https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1

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Appendix B: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by public health unit (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix C: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed or probable COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed or probable cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed or probable case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed or probable case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed or probable case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed or probable case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed or probable case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed or probable case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed or probable case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed or probable case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed or probable case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed or probable case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed or probable COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed or probable case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix D: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (37-40).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (37). SARS-CoV-2 testing is rapidly evolving and these recommendations will be subject to ongoing review.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; ideally, the same principles would be applied to recipients. Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19. All deceased donors should be routinely tested to exclude COVID-19, although transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances. The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. When testing has been performed and the potential recipient is deemed to be at low risk on epidemiological and clinical grounds, the decision to proceed to transplantation prior to test results being available in time constrained circumstances should be at the discretion of the transplant team.

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing.

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

For collection of specimens from asymptomatic members of the public being tested for surveillance (i.e. enhanced testing) purposes, standard precautions are required; additional PPE is not required. During the COVID-19 outbreak, PPE for the care of patients who are not suspected or confirmed cases of COVID-19 should be used in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (*2019). (https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019#block-views-block-file-attachments-content-block-1). These guidelines should also be considered together with the COVID-19 specific advice from the Infection Control Expert Group on the use of PPE for inpatient care https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Persons who have travelled interstate for organ and tissue retrieval and transplantation purposes should not be subject to quarantine measures, but should vigilantly self-monitor for symptoms for 14 days following their return and immediately isolate if they become unwell. These persons must continue to adhere to physical distancing measures, hand hygiene, respiratory hygiene and cough etiquette during and after travel.

Information for donation and transplant professionals

Knowledge about COVID-19 is rapidly evolving with advice and publications regarding the disease continually being updated. The guidance in this appendix will evolve due to changing circumstances, e.g. community prevalence of viral infection, viral test accessibility, and intensive care unit and hospital capacity.

Clinicians within the organ donation and transplantation sector should ensure that information utilised is in its most up to date form.

The donor risk assessment interview includes questions about travel and occupation (healthcare workers with direct patient contact) that is relevant to assessing epidemiological risk for COVID-19. In addition, it should be ascertained whether the donor has ever been tested or diagnosed with COVID-19, or has been in close contact with a person known to have confirmed, probable, or suspected COVID-19.

Routine testing of recipients prior to transplantation

Ideally, routine testing of organ recipients for SARS-CoV-2 will be undertaken, preferably within 48 hours of transplantation for recipients of living donor organs, and shortly prior to transplantation for recipients of deceased donor organs, if possible. Samples collected should include:

- Nose and throat swab (PCR test)
- Blood (for retrospective serology testing)

Testing of recipients is based on potential impact of COVID-19 during a highly-immunosuppressed post-transplantation phase. For intended recipients of living donor organs a negative result should be obtained prior to proceeding. For recipients of deceased donor organs, where possible obtain the PCR results prior to proceeding with transplantation although this should be at the discretion of the transplant team in time constrained circumstances.

Recipients (or their delegates) should be questioned to ascertain epidemiological risk and clinical features for COVID-19 prior to proceeding with transplantation. Where there is suspicion for recipient COVID-19 infection negative PCR results should be obtained prior to proceeding with transplantation. Careful consideration should be given to recipients who are at epidemiological risk and may be in the incubation period of COVID-19 where PCR tests may be negative.

Routine testing of living donors

It is recommended that routine testing of living donors (generally kidney donation) is undertaken for SARS-CoV-2 (virus causing COVID-19), preferably within the 48 hours prior to donation. Samples collected should include:

- Combined deep nasal and throat swab (PCR test), and
- Blood (for retrospective serology testing)

Obtain the PCR results prior to proceeding with donation.

Routine testing of deceased donors

Routine COVID-19 (SARS-CoV-2) virus testing should be undertaken in all deceased donors, before proceeding with donation in certain cases as described below, and generally within 72 hours of donation for all other cases. Samples collected should include:

- Combined nose and throat swab (PCR test), and
- Lower respiratory tract specimen, preferably endotracheal aspirate* (PCR test), and
- Blood (serology clotted) tube (for retrospective serology testing)

*Undertake endotracheal aspirate only if it can be done safely, as per local ICU policies. If it is not possible to collect a lower respiratory tract specimen, then a stool PCR (rectal swab) may be undertaken;SARS-COV-2 RNA may be detectable in stool for a longer duration than in respiratory tract specimens. Broncho-alveolar lavage is not currently recommended owing to the higher risk of aerosol generation and the need to conserve ICU bronchoscopes.

Where possible obtain the PCR results prior to proceeding with donation.

NOTE: Testing of donors is solely for the purpose of improving safety in transplantation and does not infer any suspicion of COVID-19 infection in these patients. Unless COVID-19 is suspected on epidemiological or clinical grounds, additional precautions to those usually employed for acquiring respiratory samples in standard, non-COVID-19 intensive care patients are NOT required. Specifically, there is no need for patient isolation or the use of non-standard ICU PPE in ongoing care of these patients. Handling of clinical specimens is as for all PC2 level organisms, as determined by WHO recommendations current at March 2020 (https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf).

Decision to proceed with donation and transplantation

- Where possible obtain COVID-19 (SARS-CoV-2) PCR results prior to proceeding with donation.
- Donors in whom COVID-19 is NOT suspected, probable or confirmed – donation can proceed without prospective PCR test results being available, noting that access to timely PCR testing is currently variable.
- In a suspect case of COVID-19 only proceed to organ retrieval and transplantation once negative PCR test results are received (donation workup can continue until this time).
- If a potential living donor has ARI symptoms, donation should be delayed until symptoms have resolved even if the test is negative. Only in time critical circumstances, and where the transplantation team has appropriately considered epidemiological and clinical risks, should transplantation proceed prior to resolution of ARI symptoms.

A **suspect case** is a patient satisfying epidemiological **AND** clinical criteria, as described in the case definition.

If it is not possible to obtain PCR test results, do not proceed in a suspect case.

NOTE: COVID-19 tests may be negative in the incubation period of up to 14 days. Diagnostic sensitivity is improved by testing lower respiratory tract samples in addition to upper respiratory tract samples.

Obtain advice from an **Infectious Disease physician** where PCR tests are negative, there is a strong clinical suspicion of COVID-19 infection, and no other cause is identified.

- **Exclude as deceased donors**:
    - If **confirmed COVID-19 positive** – do not work up for donation if known infection; stand down case if positive result obtained as part of donor workup.
    - If **probable case of COVID-19**
    - If **COVID-19 is suspected due to presence of severe bilateral community-acquired pneumonia** and no other cause is identified (irrespective of COVID-19 PCR test results).
    - If the donor suffered unexplained respiratory failure leading to death (41).
    - If prior infection, it may be safe to proceed to donation although information is limited at present. Consider only after discussion with an Infectious Disease physician and when the need for transplantation is urgent.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history (For full revision history, please refer to Appendix D)			
Version	**Date**	**Revised by**	**Changes**
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk mitigation counselling. Where cases are managed at home, consideration should be given to public health mitigation strategies in the event household contacts are exposed (see Management of contacts)

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions. Particulate filter respirators should also be considered in preference to a surgical mask in certain specified clinical settings (refer to Aerosol-generating procedures).

Contact management

Close contacts of confirmed cases must quarantine for 14 days following the last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible and should be tested if symptoms develop. Close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

2. The disease

Infectious agent

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

The predominant mode of human-to-human transmission of SARS-CoV-2 is through droplets via direct and close contact with an infected person (3). Fomite transmission is also possible, as viable virus has been detected on inanimate surfaces for up to 72 hours (4).

There is a gradient from large droplets to very small particles (aerosols), which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures). Certain behaviours, such as singing and shouting, could also increase the force and range of spread of both large and small particles. In indoor environments with a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by fans or air conditioners. In these situations, airflow may play a role in transmission.

There is some evidence that COVID-19 infection may lead to intestinal infection and SARS-CoV-2 can be present in the faeces of infected persons (5). However, to date, there is no evidence of faecal-oral transmission.

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points are dependent on a range of factors, including public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (6, 7)

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or suspected COVID-19 patients. Examples of AGPs include bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

Particulate filter respirators, such as P2 or N95 respirators, should be used only when required. Unless used correctly, i.e. with fit-checking, protection against airborne pathogen transmission will be compromised.

Note: For aerosol-generating procedures performed in areas with low or no community transmission, on patients who are NOT suspected or confirmed cases of COVID-19, particulate filter respirators are not required, i.e. a surgical mask is appropriate.

Particulate filter respirators should also be considered in preference to a surgical mask in certain specified clinical settings. For further information, see the Infection Control Expert Group guidance on the use of personal protective equipment in hospitals during the COVID-19 outbreak.

The Testing section provides detailed information on sample collection for SARS-CoV-2.

Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities.

Incubation period

Current estimates of the incubation period indicate that the majority of people become infected 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (8). The advice in this guideline uses an upper range of 14 days to guide many public health measures, such as quarantine and isolation (9-11).

Infectious period

Several studies have shown that pre-symptomatic, and asymptomatic, transmission occurs (12, 13). Pre-symptomatic transmission can occur 1-3 days before symptom onset and viral load of throat swabs is highest at symptom onset and decreases within 7 days (14)(15). Viral load in asymptomatic patients has been found to be similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (16). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (17), as viral RNA shedding is higher at symptom onset (18).

For the purposes of routine contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. At the discretion of the Public Health Unit (PHU), more conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia, dysgeusia, rhinorrhoea, chills and vomiting. Atypical symptoms of COVID-19 may also occur including chest pain, diarrhoea and conjunctivitis (19-22). Preliminary evidence suggests that children experience milder clinical symptoms and potentially fewer infections than adults (similar to SARS-CoV and MERS-CoV infections) (23-26). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (25, 27). Studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (28-30).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.3% (31). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regard to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 16 December 2020, the crude national CFR was 3.2%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Immune response

The immune response, including duration of immunity and duration of antibody response to SARS-CoV-2 infection is still being understood (32). Preliminary evidence suggests IgM and IgG antibody levels to SARS-CoV-2 may wane overtime, however more studies are required to accurately determine the duration of immunity, role of B and T memory cells and correlates of protection for COVID-19 (33-35).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure might include those who have:

- travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- care for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people are often certain occupational groups and may include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities
- residential aged care facilities
- residential care facilities
- crowded or high-density housing
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities
- homeless shelters and residential/crisis hostels
- mining sites, and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health Website (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 16 December 2020, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 72,196,732 confirmed cases and 1,630,521 deaths (31).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (36), and declared a pandemic on 12 March 2020 (37).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the Australian Health Protection Principal Committee. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practicing good hand hygiene and respiratory hygiene
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants
- Staying home and not attending public places including work or school if unwell
- Maintaining a distance of 1.5 m from people when in public

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Some jurisdictions may recommend people to consider wearing masks where it is not possible to maintain a distance of 1.5m.

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to 'stay at home' requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

3. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

4. Cases

Definition

Confirmed case

A person who:

1. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

2. has the virus isolated in cell culture, with PCR confirmation using a validated method;

Historical case

A historical case requires laboratory confirmed evidence **OR** laboratory suggestive evidence supported by either clinical evidence **OR** epidemiological evidence and is not a confirmed case

Laboratory confirmed evidence:
Undergoes a seroconversion to, or has a significant rise in, SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Laboratory suggestive evidence:
Detection of SARS-CoV-2 neutralising or IgG antibody.[1]

Clinical evidence:
1. History of measured (≥37.5°C)[2] or self-reported fever (e.g. night sweats, chills).

OR

2. History of an acute respiratory infection (e.g. cough, shortness of breath, sore throat).

Epidemiological evidence:
1. Contact with a known COVID-19 case (confirmed or historical), involving a plausible mode of transmission, at a time when the case was likely to have been infectious.

OR

2. International or domestic travel in a geographically localised area with elevated risk of community transmission[5], including travel on a cruise ship with known COVID-19 transmission on board.

Reporting

Both **confirmed cases** and **historical cases** should be notified and reported

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical evidence:
Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[3] **OR** loss of smell or loss of taste.

Epidemiological evidence:
In the 14 days prior to illness onset:

- Close contact (refer to Close contacts below) with a confirmed case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[4]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[4] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply.

If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves[1], surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/ disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Note:

[1]Vinyl gloves are not recommended for the clinical care of residents in the context of COVID-19. Powder-free latex or nitrile gloves are accepted as superior in clinical care and are less likely to be breached compared with vinyl gloves. Gloves should be selected and worn in line with the Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019).

Collection of upper respiratory samples from asymptomatic members of the public for enhanced testing

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations, but the instructions below serve as a guide.

1. Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or fever?" and record the response.
2. If the person has any symptoms, follow the infection prevention and control precautions above.
3. If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in a setting where there is low or negligible community transmission of COVID-19.
4. Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Approach to testing and specimen collection

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

The PHLN advises collecting lower respiratory tract specimens e.g. sputum for SARS-CoV-2 testing where possible. This is because the lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV.

The appropriate specimen for PCR testing is a deep nasal swab and an oropharyngeal swab, the same swab used to sample the oropharynx should be utilised for nasal sampling. It is **not** a swab of the pharynx accessed through the nares (i.e. not a nasopharyngeal swab). Saliva samples may be validated by pathology providers of PCR. For advice on selecting the appropriate specimen for diagnostic reverse transcriptase – polymerase chain reaction (RT-PCR) testing for COVID-19, refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for additional information on other testing modalities for acute infection.

Laboratory-based serology tests can help identify individuals who have developed detectable antibodies as part of an immune response to SARS-CoV-2. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection.

Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Some jurisdictions have demonstrated significant benefits of using SARS-CoV-2 genomics to inform their public health response. Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix C.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). Testing should occur day 0–2 and then on day 10–14 of hotel quarantine, with results to be received prior to release from quarantine period. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – returned travellers.

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. For further information, see Hotel quarantine workers and AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*

Post testing instructions for individuals with symptoms that may be due to COVID-19

In any communications about post-test requirements, it is important to make clear that the risk of an individual having COVID-19 is linked to whether they have **a clinically compatible illness and/or epidemiological link, rather than the fact that the person in undergoing a COVID-19 test**. A clear rationale is an important driver of appropriate behaviour.

Jurisdictions should give clear direction on requirements for people to isolate after testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

The level of isolation required after testing should consider the principles below:

- Epidemiological context
- Potential risk of transmission of undiagnosed COVID-19
- Reduction of the risk of transmission of other causes of acute respiratory illness
- The public health risk of creating a barrier to testing

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Directions on isolation requirements after testing could be divided based on the following categories:

1. People who are **not** in quarantine with a clinically compatible illness:
2. People who **are in quarantine** with a clinically compatible illness

For people not in quarantine with a clinically compatible illness:

- A person with a clinically compatible illness should stay at home until a negative test is returned AND symptoms have resolved[1].
- Whilst at home, the individual should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
- The household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions for people with symptoms compatible with COVID-19 when there is community transmission:

- Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

For people in quarantine with a clinically compatible illness:

- They should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Instructions should stress that even if the individual receives a negative test result they must remain in quarantine for the pre-determined period as determined by the relevant PHU.

Notes:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

On notification of a confirmed or suspect case, begin follow up investigation as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Complete follow up within 1 day.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing with identified close contacts placed in quarantine within 48 hours of specimen collection from the case and determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.

3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate the case and quarantine close contacts.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Testing section and PHLN guidance on laboratory testing for SARS-CoV-2) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14-day period, regardless of any negative test results. Refer to Management of contacts for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures, and in other specified clinical circumstances.** Refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the confirmed or suspect case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated isolation area that is separate from other patient areas and is not used as a thoroughfare, OR
        - at minimum, be directed to a single room with the door closed for an aerosol-generating procedure, OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or well-ventilated operating or procedure room).

If transfer outside of the room or designated isolation area is necessary, the patient should wear a surgical mask during transfer, if their condition allows.

Patients should be reminded of the importance of respiratory hygiene and cough etiquette at all times. Patients requiring oxygen therapy should be transitioned to nasal prongs where medically possible and wear a surgical mask.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare*.

Release from isolation

The following information details the circumstances under which confirmed cases can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

    a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

The case can be released from isolation if they meet all of the following criteria:

- at least 14 days have passed since onset of symptoms; and
- there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2]

    b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

The case can be released from isolation if they meet both of the following criteria [2]:

- at least 20 days have passed since the onset of symptoms; and
- the case is not significantly immunocompromised[4]

OR

The case can also be released from isolation if they meet all the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been substantial improvement in respiratory symptoms of the acute illness (including resolution of fever for the previous 72 hours)[1]; and
- the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (38, 39). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is **not** necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

5. Contacts

Close contacts

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. In a setting of limited or no community transmission, the following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

A primary close contact is anyone who has had unprotected exposure to a confirmed case. Identifying people who are secondary close contacts of those primary contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time. Identification of secondary contacts may be more applicable in household settings, situations with challenges in communication with contacts, settings with delays in testing or specific workplaces such as those with a high transmission risk.

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious (refer to Release from isolation)).
- the exposure may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)
- been exposed to a **setting or exposure site** where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for returned travelers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts

Contact needs to have occurred within the infectious period of the case: a period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings, at the discretion of the PHU.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not considered to be close contacts.

For more information about close contacts in different settings Refer to Special situations and Appendix B.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact

At the discretion of the PHU, some casual contacts may be classified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to people who do not meet the primary close contact definition (e.g. in restaurants, pubs, places of worship). The following factors should be considered prior to classifying casual contacts as primary close contacts:

- Epidemiological context, risk tolerance and level of community transmission
- Potential for the venue or setting to result in large scale amplification
- Jurisdictional capacity and resourcing requirements, including potential opportunity costs
- Adequate translation services, culturally-appropriate resources and engagement with community leaders, where appropriate

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact in any setting with a primary close contact from 24 hours after the primary contact's exposure to the case
- the exposure to the primary close contact may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

Primary close contacts:

- are required to quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.

- should be advised to monitor their health. PHUs should conduct active daily monitoring of primary close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case, during the case's infectious period.
- should be advised on the processes for seeking medical care, including on how to safely seek testing for COVID-19. Refer to Medical care for quarantined individuals.
- should be tested during the quarantine period. At a minimum this should occur
    - On entry to quarantine – a positive test result would make the primary close contact a case and support a decision to move the person to an alternative place for isolation and would also bring forward contact tracing for that person
    - If symptoms of COVID-19 develop
    - Before exit from quarantine (where appropriate)
        - For household and individually identified close contacts, and all other close contacts considered to be at higher risk of infection, finding a positive test result late in the quarantine period (e.g. day 10–12) of a primary close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community.
        - Exit screening is particularly important if the primary close contact is associated with a high risk setting or if the timing of potential exposure is likely to see infection develop later in the quarantine period.
        - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

Casual contacts

Casual contacts should be provided with information about their exposure and need to monitor for symptoms and seek testing if symptoms develop. Depending on the circumstances, they may be asked to attend for asymptomatic testing.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. exposed at a high-risk setting such as abattoir or hospital);
- The secondary contact has had extensive and/or ongoing exposure to the primary contact (e.g. living in the same household);
- There was a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary contact to become infectious prior to quarantine); or
- Secondary transmission has already occurred from a primary close contact to a secondary close contact.

Secondary close contacts should be quarantined until the PHU is certain that the primary close contact was not infectious at the time of last contact with the secondary close contact (i.e. the primary contact returns a negative test result, or the exposure time is not consistent with transmission) and contact with the primary contact is not ongoing.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may particularly be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in a closed setting (see Outbreak investigation and management in high-risk settings).

Returned travellers

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All travellers, with the exception of travellers from New Zealand in some jurisdictions, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others (if they are quarantining with other people) should they become unwell. This advice should be followed for 14 days after returning from overseas/interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19 case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

6. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts may needs to be considered.

Contact tracing in high-risk settings

In high risk settings, an aggressive and proactive approach to contact tracing is required. As a starting position, all staff on the same or overlapping shifts should be regarded as potentially at risk requiring assessment. Potential sources of information might include shift rosters, patient allocation lists, patient documentation, and tearoom logs, in addition to interviews with the case and potential contacts. In healthcare settings, it is important to consider all staff groups who may have been present – medical, nursing, allied health, paramedics, pharmacy, cleaners, pastoral care, security, contractors, students and visitors. In addition to face-to-face contact during the course of patient care, other settings such as tea rooms, shared work areas, changing rooms and bathrooms should be considered as potential locations where transmission may occur.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

High-risk settings – steps in investigation

There are several initial steps that P staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, congregate disability accommodation, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs
    - Hospitals
    - Nightclubs and bars.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up. A single case is for the purposes of initiating an investigation but may not result in detection of subsequent cases.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

4. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

5. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

6. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

7. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

8. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

9. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

10. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

11. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actions	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohor where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine perio 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

Healthcare

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to Management of contacts).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Healthcare worker exposures in the context of PPE use

Where the healthcare worker (HCW) and/or case are using PPE, a risk assessment should be performed to determine whether the contact should be designated as a close contact and quarantined for 14 days (see Tables 2a and 2b). Factors that may be considered include:

- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, wandering).
- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Note: exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Continue to work • HCW to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the HCW, and return of a negative result, prior to continuation of work.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Residential group settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible.

If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged.

Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

People with disability

Some people with disability will be at greater risk throughout the COVID-19 pandemic. This is due to:

- Risk of more serious illness if infected by COVID-19.
    - There is a high prevalence of comorbidities amongst people with disability, including chronic conditions and weakened immune systems.
    - Additionally, people with disabilities can have unrecognised, untreated or poorly managed physical or mental health conditions.
- Challenges involved in preventative measures.
    - Physical distancing can also be difficult or impossible for some people with disability. This includes those who rely on support and assistance from family members, carers and support workers.
    - Some people with disability also face barriers to implementing basic hygiene measures and safely wearing face masks. These factors put many people with disability and those that support them at higher potential risk of exposure to the virus.
    - Barriers to adequate deep nasal swabs for PCR.

Some people with disability live at home by themselves, others live with family members, or in congregate disability accommodation such as group homes or larger facilities.

Congregate disability accommodation settings are high-risk settings for infectious disease outbreaks due to higher density living, close physical contact between staff and participants, and large number of visitors and staff moving between the community and facilities.

Such settings require increased levels of risk mitigation and support to prevent COVID-19 transmission.

Preventative measures

In addition to usual preventative protocols, congregate disability accommodation should ensure that people with disability and support staff are encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette. Consideration should be given to the communication and support needs of the person with disability, and reasonable adjustments should be made as required. Information should be provided in accessible formats such as Easy Read and Auslan.

Messaging to discourage unwell visitors from visiting people with disability in congregate accommodation should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition.

Outbreaks

Outbreaks of COVID-19 in congregate disability accommodation settings should be managed with reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities. The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia, noting that a supplementary appendix is currently being drafted to address the specific needs of smaller residential care homes or congregate disability accommodation settings.

Hotel quarantine

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. The risk of exposure should be determined by those managing the quarantine/isolation setting (e.g. a Public Health Unit).

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers, ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may also determine appropriate methods for routine testing, which may include alternative testing methods (e.g. saliva).

Please see AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed case
- Duration of exposure to confirmed case
- Size of the compartment in which the crew member and confirmed case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix B: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances **where all alternative surge workforce strategies are exhausted** and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (40). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.

iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).

v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Risk assessment and identification of close contacts in aircrew

Appendix C: Information for donor and transplant professionals

Appendix D: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix C: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (41-44).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (41).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals available at https://tsanz.com.au/information/covid-19.htm

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see PHLN guidance on laboratory testing for SARS-CoV-2).

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix D: Full revision history of the COVID-19 SoNG

Revision history			
Version	**Date**	**Revised by**	**Changes**
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.

3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.

2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.

1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Revision history (For full revision history, please refer to Appendix D)			
Version	**Date**	**Revised by**	**Changes**
4.1	12 January 2020	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variants of concern.
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk mitigation counselling. Where cases are managed at home, consideration should be given to public health mitigation strategies in the event household contacts are exposed (see Management of contacts)

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions. Particulate filter respirators should also be considered in preference to a surgical mask in certain specified clinical settings (refer to Aerosol-generating procedures).

Contact management

Close contacts of confirmed cases must quarantine for 14 days following the last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible and should be tested if symptoms develop. Close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

2. The disease

Infectious agent

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

The predominant mode of human-to-human transmission of SARS-CoV-2 is through droplets via direct and close contact with an infected person (3). Fomite transmission is also possible, as viable virus has been detected on inanimate surfaces for up to 72 hours (4).

There is a gradient from large droplets to very small particles (aerosols), which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures). Certain behaviours, such as singing and shouting, could also increase the force and range of spread of both large and small particles. In indoor environments with a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by fans or air conditioners. In these situations, airflow may play a role in transmission.

There is some evidence that COVID-19 infection may lead to intestinal infection and SARS-CoV-2 can be present in the faeces of infected persons (5). However, to date, there is no evidence of faecal-oral transmission.

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points are dependent on a range of factors, including public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (6, 7)

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or suspected COVID-19 patients. Examples of AGPs include bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

Particulate filter respirators, such as P2 or N95 respirators, should be used only when required. Unless used correctly, i.e. with fit-checking, protection against airborne pathogen transmission will be compromised.

Note: For aerosol-generating procedures performed in areas with low or no community transmission, on patients who are NOT suspected or confirmed cases of COVID-19, particulate filter respirators are not required, i.e. a surgical mask is appropriate.

Particulate filter respirators should also be considered in preference to a surgical mask in certain specified clinical settings. For further information, see the Infection Control Expert Group guidance on the use of personal protective equipment in hospitals during the COVID-19 outbreak.

The Testing section provides detailed information on sample collection for SARS-CoV-2.

Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities.

Incubation period

Current estimates of the incubation period indicate that the majority of people become infected 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (8). The advice in this guideline uses an upper range of 14 days to guide many public health measures, such as quarantine and isolation (9-11).

Infectious period

Several studies have shown that pre-symptomatic, and asymptomatic, transmission occurs (12, 13). Pre-symptomatic transmission can occur 1-3 days before symptom onset and viral load of throat swabs is highest at symptom onset and decreases within 7 days (14, 15). Viral load in asymptomatic patients has been found to be similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (16). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (17), as viral RNA shedding is higher at symptom onset (18).

For the purposes of routine contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. At the discretion of the Public Health Unit (PHU), more conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia, dysgeusia, rhinorrhoea, chills and vomiting. Atypical symptoms of COVID-19 may also occur including chest pain, diarrhoea and conjunctivitis (19-22). Preliminary evidence suggests that children experience milder clinical symptoms and potentially fewer infections than adults (similar to SARS-CoV and MERS-CoV infections) (23-26). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (25, 27). Studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (28-30).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.3% (31). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regard to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 16 December 2020, the crude national CFR was 3.2%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Immune response

The immune response, including duration of immunity and duration of antibody response to SARS-CoV-2 infection is still being understood (32). Preliminary evidence suggests IgM and IgG antibody levels to SARS-CoV-2 may wane overtime, however more studies are required to accurately determine the duration of immunity, role of B and T memory cells and correlates of protection for COVID-19 (33-35).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure might include those who have:

- travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- care for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people are often certain occupational groups and may include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities
- residential aged care facilities
- residential care facilities
- crowded or high-density housing
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities
- homeless shelters and residential/crisis hostels
- mining sites, and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health Website (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 16 December 2020, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 72,196,732 confirmed cases and 1,630,521 deaths (31).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (36), and declared a pandemic on 12 March 2020 (37).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) details the national approach, the operational plan and guidance for the health sector response.

‘Human coronavirus with pandemic potential’ was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a “human biosecurity emergency” under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the Australian Health Protection Principal Committee. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practicing good hand hygiene and respiratory hygiene
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants
- Staying home and not attending public places including work or school if unwell
- Maintaining a distance of 1.5 m from people when in public

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Some jurisdictions may recommend people to consider wearing masks where it is not possible to maintain a distance of 1.5m.

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to ‘stay at home’ requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

3. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

4. Cases

Definition

Confirmed case

A person who:

1. tests positive to a validated specific SARS-CoV-2 nucleic acid test;

OR

2. has the virus isolated in cell culture, with PCR confirmation using a validated method;

Historical case

A historical case requires laboratory confirmed evidence **OR**
laboratory suggestive evidence supported by either clinical evidence **OR** epidemiological evidence and is not a confirmed case

Laboratory confirmed evidence:
Undergoes a seroconversion to, or has a significant rise in, SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre).[1]

Laboratory suggestive evidence:
Detection of SARS-CoV-2 neutralising or IgG antibody.[1]

Clinical evidence:
1. History of measured (≥37.5°C)[2] or self-reported fever (e.g. night sweats, chills).
   OR

2. History of an acute respiratory infection (e.g. cough, shortness of breath, sore throat).

Epidemiological evidence:
1. Contact with a known COVID-19 case (confirmed or historical), involving a plausible mode of transmission, at a time when the case was likely to have been infectious.
   OR

2. International or domestic travel in a geographically localised area with elevated risk of community transmission[5], including travel on a cruise ship with known COVID-19 transmission on board.

Reporting

Both **confirmed cases** and **historical cases** should be notified and reported

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical evidence:
Fever (≥37.5°C)[2] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[3] **OR** loss of smell or loss of taste.

Epidemiological evidence:
In the 14 days prior to illness onset:

- Close contact (refer to Close contacts below) with a confirmed case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[4]

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program.

[2] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[3] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[4] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply.

If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves[1], surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/ disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Note:

[1]Vinyl gloves are not recommended for the clinical care of residents in the context of COVID-19. Powder-free latex or nitrile gloves are accepted as superior in clinical care and are less likely to be breached compared with vinyl gloves. Gloves should be selected and worn in line with the Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019).

Collection of upper respiratory samples from asymptomatic members of the public for enhanced testing

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations, but the instructions below serve as a guide.

1. Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or fever?" and record the response.
2. If the person has any symptoms, follow the infection prevention and control precautions above.
3. If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in a setting where there is low or negligible community transmission of COVID-19.
4. Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Approach to testing and specimen collection

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

The PHLN advises collecting lower respiratory tract specimens e.g. sputum for SARS-CoV-2 testing where possible. This is because the lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV.

The appropriate specimen for PCR testing is a deep nasal swab and an oropharyngeal swab, the same swab used to sample the oropharynx should be utilised for nasal sampling. It is **not** a swab of the pharynx accessed through the nares (i.e. not a nasopharyngeal swab). Saliva samples may be validated by pathology providers of PCR. For advice on selecting the appropriate specimen for diagnostic reverse transcriptase – polymerase chain reaction (RT-PCR) testing for COVID-19, refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for additional information on other testing modalities for acute infection.

Laboratory-based serology tests can help identify individuals who have developed detectable antibodies as part of an immune response to SARS-CoV-2. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection.

Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Some jurisdictions have demonstrated significant benefits of using SARS-CoV-2 genomics to inform their public health response. Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix C.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). Testing should occur day 0–2 and then on day 10–14 of hotel quarantine, with results to be received prior to release from quarantine period. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – returned travellers.

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. For further information, see Hotel quarantine workers and AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*

Post testing instructions for individuals with symptoms that may be due to COVID-19

In any communications about post-test requirements, it is important to make clear that the risk of an individual having COVID-19 is linked to whether they have **a clinically compatible illness and/or epidemiological link, rather than the fact that the person in undergoing a COVID-19 test**. A clear rationale is an important driver of appropriate behaviour.

Jurisdictions should give clear direction on requirements for people to isolate after testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

The level of isolation required after testing should consider the principles below:

- Epidemiological context
- Potential risk of transmission of undiagnosed COVID-19
- Reduction of the risk of transmission of other causes of acute respiratory illness
- The public health risk of creating a barrier to testing

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Directions on isolation requirements after testing could be divided based on the following categories:

1. People who are **not** in quarantine with a clinically compatible illness:
2. People who **are in quarantine** with a clinically compatible illness

For people not in quarantine with a clinically compatible illness:

- A person with a clinically compatible illness should stay at home until a negative test is returned AND symptoms have resolved[1].
- Whilst at home, the individual should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
- The household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions for people with symptoms compatible with COVID-19 when <u>there is community transmission:</u>

- Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

For people in quarantine with a clinically compatible illness:

- They should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Instructions should stress that even if the individual receives a negative test result they must remain in quarantine for the pre-determined period as determined by the relevant PHU.

<u>Notes</u>:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

On notification of a confirmed or suspect case, begin follow up investigation as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Complete follow up within 1 day.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 with higher transmissibility overseas, whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired)[1]. Laboratories across Australia are routinely monitoring sequences for variants, including variants of concern identified in the United Kingdom (B.1.1.1.7) and Republic of South Africa (B.1.351). These are the current variants of concern and have been shown to have increased transmissibility. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing with identified close contacts placed in quarantine within 48 hours of specimen collection from the case and determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

[1] https://www.who.int/csr/don/31-december-2020-sars-cov2-variants/en/

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both

close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate the case and quarantine close contacts.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Testing

section and PHLN guidance on laboratory testing for SARS-CoV-2) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14-day period, regardless of any negative test results. Refer to Management of contacts for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures, and in other specified clinical circumstances.** Refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the confirmed or suspect case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated isolation area that is separate from other patient areas and is not used as a thoroughfare, OR
        - at minimum, be directed to a single room with the door closed for an aerosol-generating procedure, OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or well-ventilated operating or procedure room).

If transfer outside of the room or designated isolation area is necessary, the patient should wear a surgical mask during transfer, if their condition allows.

Patients should be reminded of the importance of respiratory hygiene and cough etiquette at all times. Patients requiring oxygen therapy should be transitioned to nasal prongs where medically possible and wear a surgical mask.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare*.

Release from isolation

Confirmed cases NOT infected with a SARS-CoV-2 variant of concern.

The following information details the circumstances under which confirmed cases *not infected* with a SARS-CoV-2 variant of concern, as confirmed by whole genome sequencing, can be released from isolation. Cases can be released from isolation if they meet the appropriate

criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2]

   b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

   The case can be released from isolation if they meet both of the following criteria[2]:

   - at least 20 days have passed since the onset of symptoms; and
   - the case is not significantly immunocompromised[4]

   OR

   The case can also be released from isolation if they meet all the following criteria:

   - at least 14 days have passed since the onset of symptoms;
   - there has been substantial improvement in respiratory symptoms of the acute illness (including resolution of fever for the previous 72 hours)[1]; and
   - the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

   In **addition** to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases

must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (38, 39). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is **not** necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Confirmed cases infected with a SARS-CoV-2 variant of concern

The following information details the circumstances under which confirmed cases *infected with a SARS-CoV-2 variant of concern* as confirmed by whole genome sequencing, can be released from isolation.

All cases *must* fulfil the following criteria to be considered for release from isolation:

- at least 14 days have passed since the onset of symptoms or positive PCR if asymptomatic; and
- there has been clinical resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours

In **addition** to the above criteria, cases must have a respiratory specimen for SARS-CoV-2 by PCR taken at day 12-13 from symptom onset, (or from the first positive PCR date for asymptomatic cases). Cases should be managed as follows:

- If the day 12-13 PCR is negative, the case may be released from isolation, regardless of serology result; or
- If the day 12-13 PCR has a high/long CT in consultation with the responsible authorising pathologist, and spike/neutralizing antibodies are present, then the case would be considered non-infectious and can be released from isolation. Expert public health and laboratory review should be sought if there are concerns with thresholds of the PCR or serology values to decide on release from isolation.
- If the day 12-13 PCR has a high/long CT in consultation with the responsible authorising pathologist, and no seroconversion, a repeat PCR could be performed (to ensure the result was not due to inadequate collection) and serology could be repeated. In these circumstances, expert public health and laboratory review is required to determine when the case can be released from isolation.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

5. Contacts

Close contacts

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. In a setting of limited or no community transmission, the following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

A primary close contact is anyone who has had unprotected exposure to a confirmed case. Identifying people who are secondary close contacts of those primary contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time. Identification of secondary contacts may be more applicable in household settings, situations with challenges in communication with contacts, settings with delays in testing or specific workplaces such as those with a high transmission risk.

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious (refer to Release from isolation)).
- the exposure may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)
- been exposed to a **setting or exposure site** where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for returned travelers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts

Contact needs to have occurred within the infectious period of the case: a period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings, at the discretion of the PHU.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not considered to be close contacts.

For more information about close contacts in different settings Refer to Special situations and Appendix B.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact

At the discretion of the PHU, some casual contacts may be classified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to people who do not meet the primary close contact definition (e.g. in restaurants, pubs, places of worship). The following factors should be considered prior to classifying casual contacts as primary close contacts:

- Epidemiological context, risk tolerance and level of community transmission
- Potential for the venue or setting to result in large scale amplification
- Jurisdictional capacity and resourcing requirements, including potential opportunity costs
- Adequate translation services, culturally-appropriate resources and engagement with community leaders, where appropriate

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact in any setting with a primary close contact from 24 hours after the primary contact's exposure to the case
- the exposure to the primary close contact may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

Primary close contacts:

- are required to quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.

- should be advised to monitor their health. PHUs should conduct active daily monitoring of primary close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case, during the case's infectious period.
- should be advised on the processes for seeking medical care, including on how to safely seek testing for COVID-19. Refer to Medical care for quarantined individuals.
- should be tested during the quarantine period. At a minimum this should occur
    - On entry to quarantine – a positive test result would make the primary close contact a case and support a decision to move the person to an alternative place for isolation and would also bring forward contact tracing for that person
    - If symptoms of COVID-19 develop
    - Before exit from quarantine (where appropriate)
        - For household and individually identified close contacts, and all other close contacts considered to be at higher risk of infection, finding a positive test result late in the quarantine period (e.g. day 10–12) of a primary close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community.
        - Exit screening is particularly important if the primary close contact is associated with a high risk setting or if the timing of potential exposure is likely to see infection develop later in the quarantine period.
        - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

Casual contacts

Casual contacts should be provided with information about their exposure and need to monitor for symptoms and seek testing if symptoms develop. Depending on the circumstances, they may be asked to attend for asymptomatic testing.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. exposed at a high-risk setting such as abattoir or hospital);
- The secondary contact has had extensive and/or ongoing exposure to the primary contact (e.g. living in the same household);
- There was a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary contact to become infectious prior to quarantine); or
- Secondary transmission has already occurred from a primary close contact to a secondary close contact.

Secondary close contacts should be quarantined until the PHU is certain that the primary close contact was not infectious at the time of last contact with the secondary close contact (i.e. the primary contact returns a negative test result, or the exposure time is not consistent with transmission) and contact with the primary contact is not ongoing.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may particularly be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in a closed setting (see Outbreak investigation and management in high-risk settings).

Returned travellers

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All travellers, with the exception of travellers from New Zealand in some jurisdictions, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others (if they are quarantining with other people) should they become unwell. This advice should be followed for 14 days after returning from overseas/interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19 case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

6. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts may needs to be considered.

Contact tracing in high-risk settings

In high risk settings, an aggressive and proactive approach to contact tracing is required. As a starting position, all staff on the same or overlapping shifts should be regarded as potentially at risk requiring assessment. Potential sources of information might include shift rosters, patient allocation lists, patient documentation, and tearoom logs, in addition to interviews with the case and potential contacts. In healthcare settings, it is important to consider all staff groups who may have been present – medical, nursing, allied health, paramedics, pharmacy, cleaners, pastoral care, security, contractors, students and visitors. In addition to face-to-face contact during the course of patient care, other settings such as tea rooms, shared work areas, changing rooms and bathrooms should be considered as potential locations where transmission may occur.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[2]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

[2] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[3] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

High-risk settings – steps in investigation

There are several initial steps that P staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, congregate disability accommodation, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs
    - Hospitals
    - Nightclubs and bars.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up. A single case is for the purposes of initiating an investigation but may not result in detection of subsequent cases.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[4] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

4. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

5. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

6. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[4] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

7. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

8. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

9. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

10. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

11. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actions	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohor where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine perioc 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

Healthcare

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to Management of contacts).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Healthcare worker exposures in the context of PPE use

Where the healthcare worker (HCW) and/or case are using PPE, a risk assessment should be performed to determine whether the contact should be designated as a close contact and quarantined for 14 days (see Tables 2a and 2b). Factors that may be considered include:

- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, wandering).
- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Note: exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Continue to work • HCW to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the HCW, and return of a negative result, prior to continuation of work.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Residential group settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible.

If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged.

Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

People with disability

Some people with disability will be at greater risk throughout the COVID-19 pandemic. This is due to:

- Risk of more serious illness if infected by COVID-19.
    - There is a high prevalence of comorbidities amongst people with disability, including chronic conditions and weakened immune systems.
    - Additionally, people with disabilities can have unrecognised, untreated or poorly managed physical or mental health conditions.
- Challenges involved in preventative measures.
    - Physical distancing can also be difficult or impossible for some people with disability. This includes those who rely on support and assistance from family members, carers and support workers.
    - Some people with disability also face barriers to implementing basic hygiene measures and safely wearing face masks. These factors put many people with disability and those that support them at higher potential risk of exposure to the virus.
    - Barriers to adequate deep nasal swabs for PCR.

Some people with disability live at home by themselves, others live with family members, or in congregate disability accommodation such as group homes or larger facilities.

Congregate disability accommodation settings are high-risk settings for infectious disease outbreaks due to higher density living, close physical contact between staff and participants, and large number of visitors and staff moving between the community and facilities.

Such settings require increased levels of risk mitigation and support to prevent COVID-19 transmission.

Preventative measures

In addition to usual preventative protocols, congregate disability accommodation should ensure that people with disability and support staff are encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette. Consideration should be given to the communication and support needs of the person with disability, and reasonable adjustments should be made as required. Information should be provided in accessible formats such as Easy Read and Auslan.

Messaging to discourage unwell visitors from visiting people with disability in congregate accommodation should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition.

Outbreaks

Outbreaks of COVID-19 in congregate disability accommodation settings should be managed with reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities. The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia, noting that a supplementary appendix is currently being drafted to address the specific needs of smaller residential care homes or congregate disability accommodation settings.

Hotel quarantine

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. The risk of exposure should be determined by those managing the quarantine/isolation setting (e.g. a Public Health Unit).

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers, ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may also determine appropriate methods for routine testing, which may include alternative testing methods (e.g. saliva).

Please see AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed case
- Duration of exposure to confirmed case
- Size of the compartment in which the crew member and confirmed case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix B: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances **where all alternative surge workforce strategies are exhausted** and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (40). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.

iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).

v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Risk assessment and identification of close contacts in aircrew

Appendix C: Information for donor and transplant professionals

Appendix D: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix C: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (41-44).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (41).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals available at https://tsanz.com.au/information/covid-19.htm

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see PHLN guidance on laboratory testing for SARS-CoV-2).

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix D: Full revision history of the COVID-19 SoNG

Revision history			
Version	**Date**	**Revised by**	**Changes**
4.1	12 January 2020	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.

3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.

2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.

1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Coronavirus Disease 2019 (COVID-19)
CDNA National Guidelines for Public Health Units

Revision history (For full revision history, please refer to Appendix D)			
Version	**Date**	**Revised by**	**Changes**
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: The Disease; Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variants of concern.
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk mitigation counselling. Where cases are managed at home, consideration should be given to public health mitigation strategies in the event household contacts are exposed (see Management of contacts)

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed or suspected COVID-19. Where staff are performing aerosol-generating procedures, they should use contact and airborne precautions. Particulate filter respirators should also be considered in preference to a surgical mask in certain specified clinical settings (refer to Aerosol-generating procedures).

Contact management

Close contacts of confirmed cases must quarantine for 14 days following the last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible and should be tested if symptoms develop. Close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

2. The disease

Infectious agent

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

The predominant mode of human-to-human transmission of SARS-CoV-2 is through droplets via direct and close contact with an infected person (3). Fomite transmission is also possible, as viable virus has been detected on inanimate surfaces for up to 72 hours (4).

There is a gradient from large droplets to very small particles (aerosols), which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures). Certain behaviours, such as singing and shouting, could also increase the force and range of spread of both large and small particles. In indoor environments with a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by fans or air conditioners. In these situations, airflow may play a role in transmission.

There is some evidence that COVID-19 infection may lead to intestinal infection and SARS-CoV-2 can be present in the faeces of infected persons (5). However, to date, there is no evidence of faecal-oral transmission.

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points are dependent on a range of factors, including public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (6, 7)

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak.

Airborne precautions should be used routinely when performing aerosol-generating procedures on confirmed or suspected COVID-19 patients. Examples of AGPs include bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

Particulate filter respirators, such as P2 or N95 respirators, should be used only when required. Unless used correctly, i.e. with fit-checking, protection against airborne pathogen transmission will be compromised.

Note: For aerosol-generating procedures performed in areas with low or no community transmission, on patients who are NOT suspected or confirmed cases of COVID-19, particulate filter respirators are not required, i.e. a surgical mask is appropriate.

Particulate filter respirators should also be considered in preference to a surgical mask in certain specified clinical settings. For further information, see the Infection Control Expert Group guidance on the use of personal protective equipment in hospitals during the COVID-19 outbreak.

The Testing section provides detailed information on sample collection for SARS-CoV-2.

Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities.

Incubation period

Current estimates of the incubation period indicate that the majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (8). The advice in this guideline uses an upper range of 14 days to guide many public health measures, such as quarantine and isolation (9-11).

Infectious period

Several studies have shown that pre-symptomatic, and asymptomatic, transmission occurs (12, 13). Pre-symptomatic transmission can occur 1-3 days before symptom onset and viral load of throat swabs is highest at symptom onset and decreases within 7 days (14, 15). Viral load in asymptomatic patients has been found to be similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (16). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (17), as viral RNA shedding is higher at symptom onset (18).

For the purposes of routine contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. At the discretion of the Public Health Unit (PHU), more conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia, dysgeusia, rhinorrhoea, chills and vomiting. Atypical symptoms of COVID-19 may also occur including chest pain, diarrhoea and conjunctivitis (19-22). Preliminary evidence suggests that children experience milder clinical symptoms and potentially fewer infections than adults (similar to SARS-CoV and MERS-CoV infections) (23-26). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (25, 27). Studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (28-30).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.3% (31). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regard to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 16 December 2020, the crude national CFR was 3.2%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Immune response

The immune response, including duration of immunity and duration of antibody response to SARS-CoV-2 infection is still being understood (32). Preliminary evidence suggests IgM and IgG antibody levels to SARS-CoV-2 may wane overtime, however more studies are required to accurately determine the duration of immunity, role of B and T memory cells and correlates of protection for COVID-19 (33-35).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure might include those who have:

- travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- care for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people are often certain occupational groups and may include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities
- residential aged care facilities
- residential care facilities
- crowded or high-density housing
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities
- homeless shelters and residential/crisis hostels
- mining sites, and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health Website (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 16 December 2020, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 72,196,732 confirmed cases and 1,630,521 deaths (31).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (36), and declared a pandemic on 12 March 2020 (37).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) details the national approach, the operational plan and guidance for the health sector response.

‘Human coronavirus with pandemic potential’ was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a “human biosecurity emergency” under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the Australian Health Protection Principal Committee. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practicing good hand hygiene and respiratory hygiene
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants
- Staying home and not attending public places including work or school if unwell
- Maintaining a distance of 1.5 m from people when in public

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

Some jurisdictions may recommend people to consider wearing masks where it is not possible to maintain a distance of 1.5m.

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to ‘stay at home’ requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

3. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

4. Cases

Definition

Confirmed case

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

   OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

   OR

3. SARS-CoV-2 IgG seroconversion or a significant increase in SARS-CoV-2 neutralising or IgG antibody level (e.g. four-fold or greater rise in titre)[2].

Historical case

A historical case requires laboratory suggestive evidence supported by either clinical evidence **OR** epidemiological evidence, and is not a confirmed case

Laboratory suggestive evidence:
Detection of SARS-CoV-2 neutralising or IgG antibody[2].

Clinical evidence:

1. History of measured (≥37.5°C)[3] or self-reported fever (e.g. night sweats, chills).
   OR
2. History of an acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4].

Epidemiological evidence:

1. Contact with a known COVID-19 case (confirmed or historical), involving a plausible mode of transmission, at a time when the case was likely to have been infectious.
   OR
2. International or domestic travel in a geographically localised area with elevated risk of community transmission[5], including travel on a cruise ship with known COVID-19 transmission on board.

Reporting

Both **confirmed cases** and **historical cases** should be notified and reported

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical evidence:
Fever (≥37.5°C)[3] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological evidence:
In the 14 days prior to illness onset:

- Close contact (refer to Close contacts below) with a confirmed case
- International travel
- Passengers or crew who have travelled on a cruise ship
- Healthcare, aged or residential care workers and staff with direct patient contact
- People who have lived in or travelled through a geographically localised area with elevated risk of community transmission, as defined by public health authorities[5]

Notes:

[1] There is possibility for false negative PCR results in children, as there have been some instances where children have been found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (38). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a recent history of COVID-19 vaccination.

[3] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[5] For further information on geographically localised areas with elevated risk of community transmission, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2. Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2. State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

In the context of **specimen collection from confirmed or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply.

If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves[1], surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/ disinfectant wipe in between uses.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the room.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
- The need for a gown or apron is based on risk assessment:
    - A gown or apron is needed for specimen collection, only if close physical contact with a symptomatic patient or splash/spray of body substances is anticipated.
    - If worn, a gown or apron can be worn for specimen collections from consecutive patients in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Note:

[1]Vinyl gloves are not recommended for the clinical care of residents in the context of COVID-19. Powder-free latex or nitrile gloves are accepted as superior in clinical care and are less likely to be breached compared with vinyl gloves. Gloves should be selected and worn in line with the Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019).

Collection of upper respiratory samples from asymptomatic members of the public for enhanced testing

For sample collection from asymptomatic persons with no epidemiological risk factors, standard precautions apply, including hand hygiene between individual subjects and use of appropriate PPE, based on risk assessment. It is not possible to provide details of risk assessment for all situations, but the instructions below serve as a guide.

1. Verbally 'screen' the person for symptoms: "Do you currently have any acute respiratory symptoms e.g. runny nose, sore throat, cough or fever?" and record the response.
2. If the person has any symptoms, follow the infection prevention and control precautions above.

3. If the person has no symptoms, PPE is not required for the brief period when physical distancing cannot be maintained for specimen collection and in a setting where there is low or negligible community transmission of COVID-19.
4. Perform hand hygiene before and after collecting the specimen.

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection.

For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak. For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Approach to testing and specimen collection

Routine tests for acute pneumonia/pneumonitis should be performed where indicated, including bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for respiratory pathogens, according to local protocols.

The PHLN advises collecting lower respiratory tract specimens e.g. sputum for SARS-CoV-2 testing where possible. This is because the lower respiratory tract specimens contain the highest viral loads in SARS-CoV and MERS-CoV.

The appropriate specimen for PCR testing is a deep nasal swab and an oropharyngeal swab, the same swab used to sample the oropharynx should be utilised for nasal sampling. It is **not** a swab of the pharynx accessed through the nares (i.e. not a nasopharyngeal swab). Saliva samples may be validated by pathology providers of PCR. For advice on selecting the appropriate specimen for diagnostic reverse transcriptase – polymerase chain reaction (RT-PCR) testing for COVID-19, refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for additional information on other testing modalities for acute infection.

Laboratory-based serology tests can help identify individuals who have developed detectable antibodies as part of an immune response to SARS-CoV-2. Serology does not currently have a role for diagnosis during acute illness but has utility for the diagnosis of past SARS-CoV-2 infection.

Collection of serum must be performed under transmission-based precautions if an individual is a suspect COVID-19 case or has proven COVID-19 infection and not yet released from isolation. Collection of serum from proven cases of COVID-19 who have been released from isolation can be performed using standard precautions.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Some jurisdictions have demonstrated significant benefits of using SARS-CoV-2 genomics to inform their public health response. Refer to PHLN guidance on laboratory testing for SARS-CoV-2 for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix C.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). Testing should occur day 0–2 and then on day 10–14 of hotel quarantine, with results to be received prior to release from quarantine period. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – returned travellers.

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. For further information, see Hotel quarantine workers and AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*

Post testing instructions for individuals with symptoms that may be due to COVID-19

In any communications about post-test requirements, it is important to make clear that the risk of an individual having COVID-19 is linked to whether they have **a clinically compatible illness and/or epidemiological link, rather than the fact that the person in undergoing a COVID-19 test**. A clear rationale is an important driver of appropriate behaviour.

Jurisdictions should give clear direction on requirements for people to isolate after testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

The level of isolation required after testing should consider the principles below:

- Epidemiological context
- Potential risk of transmission of undiagnosed COVID-19
- Reduction of the risk of transmission of other causes of acute respiratory illness
- The public health risk of creating a barrier to testing

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Directions on isolation requirements after testing could be divided based on the following categories:

1. People who are **not** in quarantine with a clinically compatible illness:
2. People who **are in quarantine** with a clinically compatible illness

For people not in quarantine with a clinically compatible illness:

- A person with a clinically compatible illness should stay at home until a negative test is returned AND symptoms have resolved[1].
- Whilst at home, the individual should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
- The household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions for people with symptoms compatible with COVID-19 when <u>there is community transmission:</u>

- Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

For people in quarantine with a clinically compatible illness:

- They should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Instructions should stress that even if the individual receives a negative test result they must remain in quarantine for the pre-determined period as determined by the relevant PHU.

<u>Notes</u>:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test.

In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify ‘potential source contacts’.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered.

Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

On notification of a confirmed or suspect case, begin follow up investigation as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Complete follow up within 1 day.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 with higher transmissibility overseas, whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired)[1]. Laboratories across Australia are routinely monitoring sequences for variants, including variants of concern identified in the United Kingdom (B.1.1.1.7) and Republic of South Africa (B.1.351). These are the current variants of concern and have been shown to have increased transmissibility. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing with identified close contacts placed in quarantine within 48 hours of specimen collection from the case and determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

[1] https://www.who.int/csr/don/31-december-2020-sars-cov2-variants/en/

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both

close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed and suspect cases must be protected according to recommended infection control guidelines. Visitors should be restricted to close family members.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate the case and quarantine close contacts.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection control precautions, pending further testing (refer to Testing

section and PHLN guidance on laboratory testing for SARS-CoV-2) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue quarantine for the remainder of the 14-day period, regardless of any negative test results. Refer to Management of contacts for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed or suspected COVID-19.
- **Contact, droplet and airborne precautions** are recommended when performing **aerosol-generating procedures, and in other specified clinical circumstances.** Refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak for further information.

Other recommended infection control measures include:

- When a patient with acute respiratory symptoms, and/or who meets the confirmed or suspect case definition
    - presents to a healthcare setting (GP, hospital ED, or pathology collection centre), the patient should immediately be:
        - given a surgical mask to put on if acute respiratory symptoms are present, AND
        - placed in a single room with the door closed or in a physically separated closed area designated isolation area that is separate from other patient areas and is not used as a thoroughfare, OR
        - at minimum, be directed to a single room with the door closed for an aerosol-generating procedure, OR
        - directed to a negative pressure room if an aerosol-generating procedure is to be performed (or well-ventilated operating or procedure room).

If transfer outside of the room or designated isolation area is necessary, the patient should wear a surgical mask during transfer, if their condition allows.

Patients should be reminded of the importance of respiratory hygiene and cough etiquette at all times. Patients requiring oxygen therapy should be transitioned to nasal prongs where medically possible and wear a surgical mask.

For more detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, refer to Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak.

For detailed information on standard and transmission-based precautions, (including contact, droplet, and airborne precautions) refer to the *Australian Guidelines for the Prevention and Control of Infection in Healthcare*.

Release from isolation

Confirmed cases NOT infected with a SARS-CoV-2 variant of concern.

The following information details the circumstances under which confirmed cases *not infected* with a SARS-CoV-2 variant of concern, as confirmed by whole genome sequencing, can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in either point 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1,2]

   b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

   The case can be released from isolation if they meet both of the following criteria[2]:

   - at least 20 days have passed since the onset of symptoms; and
   - the case is not significantly immunocompromised[4]

   OR

   The case can also be released from isolation if they meet all the following criteria:

   - at least 14 days have passed since the onset of symptoms;
   - there has been substantial improvement in respiratory symptoms of the acute illness (including resolution of fever for the previous 72 hours)[1]; and

- the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of current evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (39, 40). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is **not** necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.

- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Confirmed cases infected with a SARS-CoV-2 variant of concern

The following information details the circumstances under which confirmed cases *infected with a SARS-CoV-2 variant of concern* as confirmed by whole genome sequencing, can be released from isolation.

All cases *must* fulfil the following criteria to be considered for release from isolation:

- at least 14 days have passed since the onset of symptoms or positive PCR if asymptomatic; and
- there has been clinical resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours

In **addition** to the above criteria, cases must have a respiratory specimen for SARS-CoV-2 by PCR taken at day 12-13 from symptom onset, (or from the first positive PCR date for asymptomatic cases). Cases should be managed as follows:

- If the day 12-13 PCR is negative, the case may be released from isolation, regardless of serology result; or
- If the day 12-13 PCR has a high/long CT in consultation with the responsible authorising pathologist, and spike/neutralizing antibodies are present, then the case would be considered non-infectious and can be released from isolation. Expert public health and laboratory review should be sought if there are concerns with thresholds of the PCR or serology values to decide on release from isolation.
- If the day 12-13 PCR has a high/long CT in consultation with the responsible authorising pathologist, and no seroconversion, a repeat PCR could be performed (to ensure the result was not due to inadequate collection) and serology could be repeated. In these circumstances, expert public health and laboratory review is required to determine when the case can be released from isolation.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

5. Contacts

Close contacts

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. In a setting of limited or no community transmission, the following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

A primary close contact is anyone who has had unprotected exposure to a confirmed case. Identifying people who are secondary close contacts of those primary contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time. Identification of secondary contacts may be more applicable in household settings, situations with challenges in communication with contacts, settings with delays in testing or specific workplaces such as those with a high transmission risk.

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious (refer to Release from isolation)).
- the exposure may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)
- been exposed to a **setting or exposure site** where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for returned travelers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts

Contact needs to have occurred within the infectious period of the case: a period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings, at the discretion of the PHU.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not considered to be close contacts.

For more information about close contacts in different settings Refer to Special situations and Appendix B.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact

At the discretion of the PHU, some casual contacts may be classified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to people who do not meet the primary close contact definition (e.g. in restaurants, pubs, places of worship). The following factors should be considered prior to classifying casual contacts as primary close contacts:

- Epidemiological context, risk tolerance and level of community transmission
- Potential for the venue or setting to result in large scale amplification
- Jurisdictional capacity and resourcing requirements, including potential opportunity costs
- Adequate translation services, culturally-appropriate resources and engagement with community leaders, where appropriate

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact in any setting with a primary close contact from 24 hours after the primary contact's exposure to the case
- the exposure to the primary close contact may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

Primary close contacts:

- are required to quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.

- should be advised to monitor their health. PHUs should conduct active daily monitoring of primary close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case, during the case's infectious period.
- should be advised on the processes for seeking medical care, including on how to safely seek testing for COVID-19. Refer to Medical care for quarantined individuals.
- should be tested during the quarantine period. At a minimum this should occur
    - On entry to quarantine – a positive test result would make the primary close contact a case and support a decision to move the person to an alternative place for isolation and would also bring forward contact tracing for that person
    - If symptoms of COVID-19 develop
    - Before exit from quarantine (where appropriate)
        - For household and individually identified close contacts, and all other close contacts considered to be at higher risk of infection, finding a positive test result late in the quarantine period (e.g. day 10–12) of a primary close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community.
        - Exit screening is particularly important if the primary close contact is associated with a high risk setting or if the timing of potential exposure is likely to see infection develop later in the quarantine period.
        - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

Casual contacts

Casual contacts should be provided with information about their exposure and need to monitor for symptoms and seek testing if symptoms develop. Depending on the circumstances, they may be asked to attend for asymptomatic testing.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. exposed at a high-risk setting such as abattoir or hospital);
- The secondary contact has had extensive and/or ongoing exposure to the primary contact (e.g. living in the same household);
- There was a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary contact to become infectious prior to quarantine); or
- Secondary transmission has already occurred from a primary close contact to a secondary close contact.

Secondary close contacts should be quarantined until the PHU is certain that the primary close contact was not infectious at the time of last contact with the secondary close contact (i.e. the primary contact returns a negative test result, or the exposure time is not consistent with transmission) and contact with the primary contact is not ongoing.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may particularly be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in a closed setting (see Outbreak investigation and management in high-risk settings).

Returned travellers

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All travellers, with the exception of travellers from New Zealand in some jurisdictions, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others (if they are quarantining with other people) should they become unwell. This advice should be followed for 14 days after returning from overseas/interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19 case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

6. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts may needs to be considered.

Contact tracing in high-risk settings

In high risk settings, an aggressive and proactive approach to contact tracing is required. As a starting position, all staff on the same or overlapping shifts should be regarded as potentially at risk requiring assessment. Potential sources of information might include shift rosters, patient allocation lists, patient documentation, and tearoom logs, in addition to interviews with the case and potential contacts. In healthcare settings, it is important to consider all staff groups who may have been present – medical, nursing, allied health, paramedics, pharmacy, cleaners, pastoral care, security, contractors, students and visitors. In addition to face-to-face contact during the course of patient care, other settings such as tea rooms, shared work areas, changing rooms and bathrooms should be considered as potential locations where transmission may occur.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[2]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or frequent attendee of a high-risk setting.

This definition does not include a single case in an infrequent visitor of the setting. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent in the setting, and number of contacts within the setting.

[2] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see 'steps in investigation' below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

When an index[3] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

High-risk settings – steps in investigation

There are several initial steps that P staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, congregate disability accommodation, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial sites with accommodation, migrant workers accommodation, remote communities.
- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs
    - Hospitals
    - Nightclubs and bars.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up. A single case is for the purposes of initiating an investigation but may not result in detection of subsequent cases.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[4] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

4. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

5. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

6. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[4] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

7. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

8. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

9. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

10. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

11. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		**Date for quarantine**	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actions	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

Healthcare

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to Management of contacts).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Healthcare worker exposures in the context of PPE use

Where the healthcare worker (HCW) and/or case are using PPE, a risk assessment should be performed to determine whether the contact should be designated as a close contact and quarantined for 14 days (see Tables 2a and 2b). Factors that may be considered include:

- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, wandering).
- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Note: exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Continue to work • HCW to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the HCW, and return of a negative result, prior to continuation of work.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Residential group settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible.

If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged.

Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

People with disability

Some people with disability will be at greater risk throughout the COVID-19 pandemic. This is due to:

- Risk of more serious illness if infected by COVID-19.
    - There is a high prevalence of comorbidities amongst people with disability, including chronic conditions and weakened immune systems.
    - Additionally, people with disabilities can have unrecognised, untreated or poorly managed physical or mental health conditions.
- Challenges involved in preventative measures.
    - Physical distancing can also be difficult or impossible for some people with disability. This includes those who rely on support and assistance from family members, carers and support workers.
    - Some people with disability also face barriers to implementing basic hygiene measures and safely wearing face masks. These factors put many people with disability and those that support them at higher potential risk of exposure to the virus.
    - Barriers to adequate deep nasal swabs for PCR.

Some people with disability live at home by themselves, others live with family members, or in congregate disability accommodation such as group homes or larger facilities.

Congregate disability accommodation settings are high-risk settings for infectious disease outbreaks due to higher density living, close physical contact between staff and participants, and large number of visitors and staff moving between the community and facilities.

Such settings require increased levels of risk mitigation and support to prevent COVID-19 transmission.

Preventative measures

In addition to usual preventative protocols, congregate disability accommodation should ensure that people with disability and support staff are encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette. Consideration should be given to the communication and support needs of the person with disability, and reasonable adjustments should be made as required. Information should be provided in accessible formats such as Easy Read and Auslan.

Messaging to discourage unwell visitors from visiting people with disability in congregate accommodation should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition.

Outbreaks

Outbreaks of COVID-19 in congregate disability accommodation settings should be managed with reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities. The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia, noting that a supplementary appendix is currently being drafted to address the specific needs of smaller residential care homes or congregate disability accommodation settings.

Hotel quarantine

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. The risk of exposure should be determined by those managing the quarantine/isolation setting (e.g. a Public Health Unit).

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers, ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may also determine appropriate methods for routine testing, which may include alternative testing methods (e.g. saliva).

Please see AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

7. Special situations

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Air crew

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the airline in conjunction with the PHU to identify which crew should be managed as close contacts.

Considerations for conducting a risk assessment should include:

- Proximity of crew to confirmed case
- Duration of exposure to confirmed case
- Size of the compartment in which the crew member and confirmed case interacted
- Precautions taken, including PPE worn, when in close proximity to the confirmed case

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as close contacts.

Where it has been determined that a crewmember is a close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix B: Risk assessment and identification of close contacts in aircrew.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances **where all alternative surge workforce strategies are exhausted** and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (41). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.

iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).

v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Risk assessment and identification of close contacts in aircrew

Appendix C: Information for donor and transplant professionals

Appendix D: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist airlines undertaking risk assessments in consultation with PHUs to identify which air crew are close contacts of a confirmed COVID-19 case. The recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed other passengers and crew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while symptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious. This risk assessment is directed at identifying air crew close contacts. Contact management among passengers is the responsibility of public health units.

General principles

- Case-by-case risk assessments should be conducted by the airline in consultation with PHUs to identify close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- Risk assessments for air crew should be consistent with criteria for being a close contact:
    - Face-to-face contact in any setting with a confirmed case, for greater than 15 minutes cumulative over the course of a week, in the period extending from 48 hours before onset of symptoms in the confirmed case;
    - Sharing of a closed space (i.e. the same air craft section) with a confirmed case for a prolonged period (more than 2 hours) in the period extending from 48 hours before onset of symptoms in the confirmed case; or
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.
- Risk assessments should be conducted in consultation with the relevant public health unit, particularly where the exposures are unclear or complex.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the airline to identify which crew member(s) should be managed as close contacts.

Considerations for conducting a risk assessment should include:

1. Proximity of crew to confirmed case
   Crew who have had face-to-face contact with an infected passenger for greater than 15 minutes cumulative during the course of the flight should be considered close contacts.

2. Duration of exposure to confirmed case
   Crew who provided prolonged periods of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

3. Size of the compartment in which the crew and confirmed case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service for greater than 15 minutes cumulative in confined sections (e.g. first or business class) where the infected passenger was seated should be considered close contacts.

4. Precautions taken, including PPE worn, when in close proximity to the confirmed case
   Crew who were involved in looking after an infected passenger (e.g. providing first aid) who was ill without wearing appropriate PPE should be considered close contacts.

Cockpit crew who did not walk through cabins or come close to the infected passenger(s) or crew member(s) are not considered to be close contacts.

Where the confirmed COVID-19 case is an aircraft crew member, all crew should be considered close contacts unless there is evidence that they have not had close contact with the case. In this circumstance, public health units will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. The same general principles and considerations detailed above can be adapted to identify close contacts in these circumstances.

If an airline becomes aware that a crew member or passenger is a close contact of a confirmed case, they should notify the local public health unit to facilitate management of the close contact/s.

Appendix C: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (42-45).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (42).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals available at https://tsanz.com.au/information/covid-19.htm

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see PHLN guidance on laboratory testing for SARS-CoV-2).

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix D: Full revision history of the COVID-19 SoNG

Revision history			
Version	**Date**	**Revised by**	**Changes**
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing

			indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.

2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.

1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 4.3, 04 March 2021

Revision history (For full revision history, please refer to Appendix E)			
Version	**Date**	**Revised by**	**Changes**
4.3	04 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: The Disease; Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variants of concern.
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

This document summarises recommendations for surveillance, infection control, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). CDNA will review and update these recommendations as required as new information becomes available on COVID-19 and the situation in Australia. These Guidelines will be updated regularly.

Readers should not rely solely on the information contained within these Guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these Guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these Guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the World Health Organization Director-General's remarks: (https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020)
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

All confirmed cases must be isolated until they meet the appropriate release from isolation criteria. Cases should only be managed at home or in other community settings if the home environment permits separation of the case from other household members and following implementation of appropriate infection control measures and risk mitigation counselling. Where cases are managed at home, consideration should be given to public health mitigation strategies in the event household contacts are exposed (see Management of contacts)

Hospitalised patients should be isolated in a single room, a designated COVID-19 ward or, if symptoms are severe and, where available, in a negative pressure room. Clinical staff should use contact and droplet precautions for routine care of patients with confirmed or suspected COVID-19. Where staff are performing aerosol-generating procedures or in specified clinical settings they should use contact and airborne precautions. A particulate filter respirator (PFR) is required for airborne precautions. See the Infection Control Expert Group (ICEG) *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak* for more information.

Contact management

Close contacts of confirmed cases must quarantine for 14 days following the last close contact with the case during the case's infectious period. Close contacts should be actively monitored for development of fever or respiratory symptoms during this period, where feasible and should be tested if symptoms develop. Close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

2. The disease

Infectious agent

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the infective agent that causes coronavirus disease 2019 (COVID-19). SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 79.6% sequence identity to SARS-CoV-1 (1).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Adaption has led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV, but there are also human coronaviruses that cause more mild illness in humans, such as the coronaviruses that cause the common cold.

Reservoir

It is highly likely that the virus has come from an animal source. Genomic analysis suggests that bats appear to be the reservoir of SARS-CoV-2 virus (2), but the intermediate host has not yet been identified (3).

Mode of transmission

The predominant mode of human-to-human transmission of SARS-CoV-2 is through droplets via direct and close contact with an infected person (3). Fomite transmission is also possible, as viable virus has been detected on inanimate surfaces for up to 72 hours (4).

There is a gradient from large droplets to very small particles (aerosols), which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures). Certain behaviours, such as singing and shouting, could also increase the force and range of spread of both large and small particles. In indoor environments with a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by fans or air conditioners. In these situations, airflow may play a role in transmission.

There is some evidence that COVID-19 infection may lead to intestinal infection and SARS-CoV-2 can be present in the faeces of infected persons (5). However, to date, there is no evidence of faecal-oral transmission.

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4, with R_0 for confined settings, e.g. cruise ships, at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points are dependent on a range of factors, including public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (6, 7)

Aerosol-generating procedures

Appropriate care should be taken during aerosol-generating procedures. Listed examples of aerosol-generating procedures are available in the ICEG *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak*.

Airborne precautions are required when performing aerosol-generating procedures on confirmed or suspected COVID-19 patients. This includes the use of a particulate filter respirator (PFR). Examples of aerosol-generating procedures include bronchoscopy, intubation, suctioning etc. in hospital settings. Nebuliser use should be discouraged and alternative administration devices (e.g. spacers) should be used.

PFRs should also be considered in preference to a surgical mask in certain specified clinical settings. Health care workers who use PFRs should be trained in their correct use, including how to perform a fit-check each and every time a PFR is donned and safe removal. For further information including information on fit testing in addition to fit checking, see the ICEG *Guidance on the use of personal protective equipment in hospitals during the COVID-19 outbreak*.

The Testing section provides detailed information on sample collection for SARS-CoV-2.

Environmental evaluation

Where local transmission of COVID-19 is thought possible, a thorough review of contributing environmental factors should be done. This should include a review of infection control procedures, and opportunities for exposure to respiratory or faecal contamination.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities.

Incubation period

Current estimates of the incubation period indicate that the majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (8). The advice in this guideline uses an upper range of 14 days to guide many public health measures, such as quarantine and isolation (9-11).

Infectious period

Several studies have shown that pre-symptomatic, and asymptomatic, transmission occurs (12, 13). Pre-symptomatic transmission can occur 1-3 days before symptom onset and viral load of throat swabs is highest at symptom onset and decreases within 7 days (14, 15). Viral load in asymptomatic patients has been found to be similar to that of symptomatic patients, suggesting transmission potential of asymptomatic, or minimally symptomatic patients (16). The risk of transmission from symptomatic or pre-symptomatic cases is considered to be higher than from asymptomatic cases (17), as viral RNA shedding is higher at symptom onset (18).

For the purposes of routine contact tracing, cases are considered to be infectious from 48 hours prior to onset of symptoms. At the discretion of the Public Health Unit (PHU), more conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness for approximately 80% of cases, with fever and cough being the most commonly reported symptoms. Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, anosmia, dysgeusia, rhinorrhoea, chills and vomiting. Atypical symptoms of COVID-19 may also occur including chest pain, diarrhoea and conjunctivitis (19-22). Preliminary evidence suggests that children experience milder clinical symptoms and potentially fewer infections than adults (similar to SARS-CoV and MERS-CoV infections) (23-26). Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (3).

Some individuals remain asymptomatic (25, 27). Studies estimate that the asymptomatic proportion of cases ranges from 18% to 42% (28-30).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.2% (31). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially in regard to mild cases, and the impact of health systems on patient outcomes. Mortality of cases is, to a significant extent, determined by individual risk factors and healthcare quality and access. Based on surveillance data notified in Australia as of 02 March 2021, the crude national CFR was 3.1%. The crude CFR is a point in time measurement, and the clinical resolution or death of current cases may alter the CFR.

Immune response

The immune response, including duration of immunity and duration of antibody response to SARS-CoV-2 infection is still being understood (32). Preliminary evidence suggests IgM and IgG antibody levels to SARS-CoV-2 may wane overtime, however more studies are required to accurately determine the duration of immunity, role of B and T memory cells and correlates of protection for COVID-19 (33-35).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure might include those who have:

- travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- care for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people are often certain occupational groups and may include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities
- residential aged care facilities
- residential care facilities
- crowded or high-density housing
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities
- homeless shelters and residential/crisis hostels
- mining sites, and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health Website (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19).

Disease occurrence and public health significance

Cases of COVID-19 were initially associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 16 December 2020, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 72,196,732 confirmed cases and 1,630,521 deaths (31).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (36), and declared a pandemic on 12 March 2020 (37).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19) details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the Biosecurity (Listed Human Diseases) Determination 2016 as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the Australian Health Protection Principal Committee. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practising effective hand hygiene and respiratory hygiene;
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants;
- Staying home and not attending public places including work or school if unwell;
- Maintaining a distance of 1.5 m from people when in public; and
- Wearing a face mask in situations where physical distancing cannot be maintained.

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

During outbreaks or in the presence of sustained community transmission, the use of masks in the community can supplement other control measures. See the ICEG guidance *Are cloth face masks likely to provide protection against COVID-19?*

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to 'stay at home' requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

3. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

4. Cases

Definition

Confirmed case

The rationale for the current confirmed case definition is to ensure appropriate reporting, case management and public health follow up of people who could potentially transmit SARS-CoV-2.

A confirmed case requires laboratory definitive evidence and is not classified as a historical case.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

   OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

   OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Historical case

A historical case requires laboratory suggestive evidence supported by either previous (prior to the past 14 days) clinical evidence **OR** previous (prior to the past 14 days) epidemiological evidence.

A historical case should not have symptoms of COVID-19 (or not have had symptoms of COVID-19 for the past 14 days). For information on the steps for determining a historical infection, please see Release from Isolation.

Laboratory suggestive evidence:

1. Detection of SARS-CoV-2 by polymerase chain reaction (PCR) on two specimens at least 24 hours apart with high Ct values[3] on both specimens AND detection of IgG or total antibody, in the absence of vaccination[2,4];
   OR
2. Negative PCR result AND detection of IgG or total antibody, in the absence of vaccination[2];
   OR
3. High PCR Ct result on first result, and higher PCR Ct result or negative PCR result on second test, taken >24 hours apart.

Clinical evidence:

Fever (≥37.5°C) or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[5] **OR** loss of smell or loss of taste.

Epidemiological evidence:

- Close contact (refer to Close contacts below) with a confirmed case
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services

- International border staff
- Air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2[6].

Reporting

Confirmed cases should be notified in the jurisdiction of diagnosis and reported to the National Notifiable Diseases Surveillance System, except if previously diagnosed overseas or in another Australian jurisdiction.

Historical cases should be notified in the jurisdiction of diagnosis and reported to the National Notifiable Diseases Surveillance System, except if previously diagnosed overseas or in another Australian jurisdiction as a confirmed case.

People who have previously been diagnosed and managed overseas or in another Australian jurisdiction do not need to be notified as a confirmed or historical case. In this situation, the person should provide documented evidence of diagnosis overseas/interstate to the PHU.

Suspect case

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

A person who meets the following clinical **AND** epidemiological criteria:

Clinical evidence:

Fever (≥37.5°C)[3] or history of fever (e.g. night sweats, chills) **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] **OR** loss of smell or loss of taste.

Epidemiological evidence:

In the 14 days prior to illness onset:

- Close contact (refer to Close contacts below) with a confirmed case
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services
- International border staff
- Air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2[6].

Notes:

[1] There is possibility for false negative PCR results in children, as some children may be found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (38). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a recent history of COVID-19 vaccination.

[3] The cycle threshold (Ct) value of a reaction is the cycle number when the fluorescence of a PCR product is first detected above the background signal. The lower the Ct value, the more virus is present in the sample being tested, as fewer amplification cycles are required before the threshold for detection is met. A high Ct value generally indicates that it takes longer i.e. more cycles to detect the virus, indicating that there is less viral RNA present in the sample. Each PCR assay may have a different Ct value that is used for detecting SARS-CoV-2. Ct values for one in-vitro diagnostic (IVD) device should not be compared with Ct values from other platforms. This means there is no 'set' Ct value to aim for across all platforms. High Ct values are as defined in consultation with the responsible supervising pathologist.

[4] Occasionally a person may have a positive PCR result, with high Ct values, on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another organism. A further swab collected at least 24 hours after the positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, a full respiratory panel for other pathogens should be done.

[5] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

[6] For further information on areas with recent local transmission of SARS-CoV-2, refer to the Department of Health website: (https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm)

Testing

Persons meeting the suspect case definition should be tested for SARS-CoV-2.

Persons meeting the enhanced testing criteria should be tested for SARS-CoV-2.

State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

To guide local approaches to testing, please refer to the *CDNA and PHLN Testing Framework for COVID-19 in Australia* (Testing Framework). The Testing Framework identifies key priority groups for targeted testing based on the likelihood of infection and the epidemiological situation. The Testing Framework also provides guidance on appropriate test types based on specific circumstances. Jurisdictions can apply this guidance according to their local context.

In the context of **specimen collection from confirmed or suspect cases** in a clinic or pathology collection centre, when specimen collection is the only procedure required, the following infection prevention and control precautions apply.

If clinical examination is required, full contact and droplet precautions should be observed as described in the *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak* and *Recommended minimum requirements for the use of masks or respirators by health and residential care workers in areas with significant community transmission of COVID-19.*

Where a person is asymptomatic but is tested as a part of active case finding (e.g. in an outbreak) they should be treated the same as a symptomatic person with regards to PPE requirements during sample collection. For detailed guidance on the use of PPE in hospitals during the COVID-19 outbreak, see the ICEG *Guidance on the use of PPE in hospitals during the COVID-19 outbreak*.

Infection prevention and control precautions:

- Perform hand hygiene
- Use gloves[1], gown, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/ disinfectant wipe in between uses by the same person.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the area.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
    - You can wear the same gown to collect specimens from more than one patient in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Note:

[1]Vinyl gloves are not recommended for the clinical care of residents in the context of COVID-19. Powder-free latex or nitrile gloves are accepted as superior in clinical care and are less likely to be breached compared with vinyl gloves. Gloves should be selected and worn in line with the Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019).

For information on circumstances requiring airborne precautions, refer to aerosol-generating procedures.

Approach to specimen collection and diagnostic testing for SARS-CoV-2

Laboratory testing for SARS-CoV-2 is important for individual patient diagnosis, and to guide infection prevention and control procedures and public health investigations. The main sample types submitted for testing are respiratory tract samples (upper and lower tract) and sera. Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) is the method of choice to detect SARS-CoV-2 during the acute illness.

Routine tests for acute pneumonia/pneumonitis should be requested where indicated and according to local protocols. This may include bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for other respiratory pathogens.

The occurrence of viral coinfection in SARS-CoV-2 has been negligible in Australia to date. However, if SARS-CoV-2 is not detected, testing for other common respiratory viruses in a person with an acute respiratory tract infection may be clinically appropriate.

For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; or the different types of SARS-CoV-2 specific testing, please refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Refer to PHLN guidance on laboratory testing for SARS-CoV-2 and Genome sequencing for all cases for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, **OR** acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix C.

Jurisdictions will arrange to test people who are in hotel quarantine due to international travel (i.e. 'returned travellers'). Testing should occur day 0–2 and then on day 10–14 of hotel quarantine, with results to be received prior to release from quarantine period. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – returned travellers.

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. For further information, see Hotel quarantine workers and AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak*

Post testing instructions for individuals with symptoms that may be due to COVID-19

In any communications about post-test requirements, it is important to make clear that the risk of an individual having COVID-19 is linked to whether they have **a clinically compatible illness and/or epidemiological link, rather than the fact that the person in undergoing a COVID-19 test**. A clear rationale is an important driver of appropriate behaviour.

Jurisdictions should give clear direction on requirements for people to isolate after testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

The level of isolation required after testing should consider the principles below:

- Epidemiological context
- Potential risk of transmission of undiagnosed COVID-19
- Reduction of the risk of transmission of other causes of acute respiratory illness
- The public health risk of creating a barrier to testing

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Directions on isolation requirements after testing could be divided based on the following categories:

1. People who are **not** in quarantine with a clinically compatible illness:
2. People who **are in quarantine** with a clinically compatible illness

For people not in quarantine with a clinically compatible illness:

- A person with a clinically compatible illness should stay at home until a negative test is returned AND symptoms have resolved[1].
- Whilst at home, the individual should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
- The household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions for people with symptoms compatible with COVID-19 when there is community transmission:

- Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

For people in quarantine with a clinically compatible illness:

- They should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Instructions should stress that even if the individual receives a negative test result they must remain in quarantine for the pre-determined period as determined by the relevant PHU.

Notes:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is **when there is a lack of an epidemiological risk factor for acquisition of COVID-19**, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the **PHUs first contact the laboratory microbiologist** to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in **close collaboration with the laboratory microbiologist and the treating clinician:**

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify ‘potential source contacts’.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

On notification of a confirmed or suspect case, begin follow up investigation as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Complete follow up within 1 day.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 (39, 40), whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no clear

epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are returned travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing with identified close contacts placed in quarantine within 48 hours of specimen collection from the case and determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-7 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact with the index case in any setting for greater than 15 minutes cumulative over the course of a week, or,
- sharing of a closed space with the index case for a prolonged period (e.g. more than 2 hours).

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications.

Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should provide a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease; and
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place.

Healthcare workers and others who come into contact with confirmed and suspect cases must be protected according to recommended infection prevention and control guidelines.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. See Release from isolation for further information.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection prevention and control precautions, pending further testing (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are close contacts or are required to quarantine for other purposes (e.g. international travel) must continue to quarantine for the remainder of the 14-day period, regardless of any negative test results. Refer to Management of contacts for further information.

In addition to standard precautions, including hand hygiene (5 Moments), recommendations for the use of PPE during clinical care of people with confirmed or suspected COVID-19 are:

- **Contact and droplet precautions** are recommended for **routine care** of patients with confirmed or suspected COVID-19.
- **Contact and airborne precautions** are recommended when performing **aerosol-generating procedures, and in other specified clinical circumstances.** Refer to *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak* and *Recommended minimum requirements for the use of masks or respirators by health and residential care workers in areas with significant community transmission of COVID-19* for further information.

For detailed guidance on infection prevention and control precautions for clinical care of people with confirmed or suspected COVID-19, see the ICEG *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak* and ICEG *Guidance on the use of PPE in non-inpatient health care settings, during the COVID-19 outbreak.*

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as travellers from overseas, may test PCR positive during their quarantine period, however, their infection may have occurred overseas at an earlier time and be 'historic' rather than acute. Similarly, occasionally a person may have a positive PCR result that has high Ct values[1] and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another organism. A further swab collected at least 24 hours after the positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, a full respiratory panel for other pathogens should be done. If the person meets **all** the following criteria, it can be considered that they have had a previous infection, and there is no public health need for further isolation or management of contacts:

1. High PCR Ct results, on 2 specimens, or with the second specimen negative, collected at least 24 hours apart, ideally processed via the same laboratory and platform. Note that:
    - High Ct values are as defined in consultation with the responsible supervising pathologist.
    - Specimens should ideally be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first high PCR Ct result.

Formal documentation of previous infection is not necessary; however, some PHU and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Confirmed cases known to be due to SARS-CoV-2 which is not a variant of concern and who do not meet the criteria for a historical infection

The following information details the circumstances under which confirmed cases *not infected* with a SARS-CoV-2 variant of concern, as confirmed by whole genome sequencing, can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of the respiratory symptoms of the acute illness and fever for the previous 72 hours[1,2]

   b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

   The case can be released from isolation if they meet both of the following criteria[2]:

   - at least 20 days have passed since the onset of symptoms; and
   - the case is not significantly immunocompromised[4]

   OR

   The case can also be released from isolation if they meet all the following criteria:

   - at least 14 days have passed since the onset of symptoms;
   - there has been resolution of fever for the previous 72 hours;
   - there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
   - the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In **addition** to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture, serology results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of available evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (41-43). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and **do not need to meet** a higher standard or undergo additional assessment before going into any high-risk settings. This includes

persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is **not** necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to Outbreak investigation and management in high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.

- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to **all** cases upon release from isolation.

Confirmed cases who do not meet the criteria for a historical infection and are infected with a SARS-CoV-2 variant of concern or unknown variant

The following information details the circumstances under which confirmed cases *infected with a SARS-CoV-2 variant of concern* as confirmed by whole genome sequencing, can be released from isolation.

These criteria also apply to confirmed cases who:

1. do not meet the criteria for release from isolation as a historical infection; and
2. are infected with an unknown SARS-CoV-2 variant. This includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern.

All cases *must* fulfil the following criteria to be considered for release from isolation:

- at least 14 days have passed since the onset of symptoms or positive PCR if asymptomatic; and
- there has been clinical resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours

In **addition** to the above criteria, cases must have a respiratory specimen for SARS-CoV-2 by PCR taken at day 12-13 from symptom onset, (or from the first positive PCR date for asymptomatic cases). Cases should be managed as follows:

- If the day 12-13 PCR is negative, the case may be released from isolation, regardless of serology result; or
- If the day 12-13 PCR has a high Ct and spike or neutralising antibodies are present (Ct and antibody cut-off levels agreed in consultation with the responsible supervising pathologist), then the case would be considered non-infectious and can be released from isolation. Expert public health and laboratory review should be sought if there are concerns with thresholds of the PCR or serology values to decide on release from isolation.
- If the day 12-13 PCR has a high Ct in consultation with the responsible supervising pathologist, and no seroconversion, or serology is not available, a repeat PCR could be performed (to ensure the result was not due to inadequate collection) and serology could be repeated, if available. In these circumstances, expert public health and laboratory review is required to determine when the case can be released from isolation.
- If the day 12-13 PCR has a low Ct in consultation with the responsible supervising pathologist, regardless of the serology result, expert public health and laboratory review is required to determine further testing and isolation.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

5. Contacts

Close contacts

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. In a setting of limited or no community transmission, the following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

A primary close contact is anyone who has had unprotected exposure to a confirmed case. Identifying people who are secondary close contacts of those primary contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Identification of secondary contacts may be more applicable in household settings; situations where there are communication challenges with contacts; where the primary close contact may already be infected; settings where there may be delays in receiving testing results (e.g. remote settings); or where secondary contacts work in settings where there is a high transmission risk (e.g. residential aged care).

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious (refer to Release from isolation)).
- the exposure may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)
- been exposed to a **setting or exposure site** where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for returned travelers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts

Contact needs to have occurred within the infectious period of the case: a period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings, at the discretion of the PHU.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not generally considered to be primary close contacts, provided that appropriate PPE has been worn and there has not been any breaches.
- For aircraft passengers, passengers who were seated in the same row or two rows in front or behind a confirmed case are considered primary close contacts in most instances. Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport. If the confirmed case was infected with a SARS-CoV-2 variant of concern, PHUs may consider classifying all passengers on board the flight as primary close contacts. Similar criteria can be used for people who have had close contact on bus or train trips.
- For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify which crew members should be considered primary close contacts. Refer to Special situations and Appendix B for further information.
- For more information about close contacts in different settings, refer to Special situations and Appendix B.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact

At the discretion of the PHU, some casual contacts may be classified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to people who do not meet the primary close contact definition (e.g. in restaurants, pubs, places of worship). The following factors should be considered prior to classifying casual contacts as primary close contacts:

- Epidemiological context, risk tolerance and level of community transmission
- Potential for the venue or setting to result in large scale amplification
- Jurisdictional capacity and resourcing requirements, including potential opportunity costs
- Adequate translation services, culturally-appropriate resources and engagement with community leaders, where appropriate

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact in any setting with a primary close contact from 24 hours after the primary contact's exposure to the case
- the exposure to the primary close contact may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

Primary close contacts:

- are required to quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- should be advised to monitor their health. PHUs should conduct active daily monitoring of primary close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case, during the case's infectious period.
- should be advised on the processes for seeking medical care, including on how to safely seek testing for COVID-19. Refer to Medical care for quarantined individuals.
- should be tested during the quarantine period. At a minimum this should occur
    - On entry to quarantine – a positive test result would make the primary close contact a case and support a decision to move the person to an alternative place for isolation and would also bring forward contact tracing for that person
    - If symptoms of COVID-19 develop
    - Before exit from quarantine (where appropriate)
        - For household and individually identified close contacts, and all other close contacts considered to be at higher risk of infection, finding a positive test result late in the quarantine period (e.g. day 10–12) of a primary close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community.
        - Exit screening is particularly important if the primary close contact is associated with a high risk setting or if the timing of potential exposure is likely to see infection develop later in the quarantine period.
        - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

Casual contacts

Casual contacts should be provided with information about their exposure and need to monitor for symptoms and seek testing if symptoms develop. Depending on the circumstances, they may be asked to attend for asymptomatic testing.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. exposed at a high-risk setting such as abattoir or hospital);
- The secondary contact has had extensive and/or ongoing exposure to the primary contact (e.g. living in the same household);
- There was a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary contact to become infectious prior to quarantine); or
- Secondary transmission has already occurred from a primary close contact to a secondary close contact.

Secondary close contacts should be quarantined until the PHU is certain that the primary close contact was not infectious at the time of last contact with the secondary close contact (i.e. the primary contact returns a negative test result, or the exposure time is not consistent with transmission) and contact with the primary contact is not ongoing.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may particularly be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in a closed setting (see Outbreak investigation and management in high-risk settings).

Returned travellers

Returned travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All travellers, with the exception of travellers from New Zealand in some jurisdictions, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. Returned travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined returned travellers should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals. All returned travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others (if they are quarantining with other people) should they become unwell. This advice should be followed for 14 days after returning from overseas/interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10–12 of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the returned traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the returned traveller should be isolated and managed as per the recommendations for confirmed cases.

All returned travellers who have undertaken international travel in the last 14 days **who are unwell** with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who **may** be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19 case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

6. Outbreak investigation and management in high-risk settings

This section focuses on the epidemiological investigation and response to an outbreak in a high-risk setting (i.e. a setting where there is potential for rapid transmission). Investigations in these settings differ as a wider range of contacts may needs to be considered.

Contact tracing in high-risk settings

In high risk settings, an aggressive and proactive approach to contact tracing is required. As a starting position, all staff on the same or overlapping shifts should be regarded as potentially at risk requiring assessment. Potential sources of information might include shift rosters, patient allocation lists, patient documentation, and tearoom logs, in addition to interviews with the case and potential contacts. In healthcare settings, it is important to consider all staff groups who may have been present – medical, nursing, allied health, paramedics, pharmacy, cleaners, pastoral care, security, contractors, students and visitors. In addition to face-to-face contact during the course of patient care, other settings such as tea rooms, shared work areas, changing rooms and bathrooms should be considered as potential locations where transmission may occur.

A high-risk setting is defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups.
- Workplace settings where previous outbreaks have shown large scale amplification.

Note that some of these settings have specific guidance documents[1]. Examples of these settings are provided below.

Within these settings, for the purposes of investigation, an outbreak is defined as:

- A single confirmed case of COVID-19 in a resident, staff member or attendee of a high-risk setting.

This definition includes any confirmed case who attends a high-risk setting during their infectious period.

Due to the importance of undertaking early action to minimise transmission within a high-risk setting, PHU should consider advising that the facility should implement some of these actions (see ‘steps in investigation’ below) where an outbreak is suspected, whilst awaiting laboratory confirmation.

[1] Aboriginal and Torres Strait Islander rural and remote communities - https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19
Residential care facilities - https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities
Correctional and detention facilities - https://www.health.gov.au/resources/publications/cdna-guidelines-for-the-prevention-control-and-public-health-management-of-covid-19-outbreaks-in-correctional-and-detention-facilities-in-australia

When an index[2] case of COVID-19 is identified who likely acquired their infection within the setting (i.e. the case has not left the setting within the previous 14 days), then it is likely that there are already other transmission chains.

HIGH-RISK SETTINGS – STEPS IN INVESTIGATION

There are several initial steps that Public Health staff need to take when responding to an outbreak of COVID-19 in high-risk settings. Further details for each step are provided below.

1. Define the setting.
2. Confirm and declare a COVID-19 outbreak with one confirmed case.
3. Identify those most at risk of severe disease.
4. Arrange diagnostic testing for COVID-19 for all members of the setting. If available, consider additional serological tests. If other members of the setting are symptomatic, test these individuals for other respiratory pathogens such as influenza as well as COVID-19.
5. Ensure that the facility managers have notified ALL staff, residents (where applicable) and visitors as relevant, that cases of COVID-19 have occurred in the setting.
6. Advise staff about enhanced implementation of infection control measures. Determine if staff have worked at any other aged care facility or provided in home care in the last 14 days.
7. Collate information onto a line list that describes people infected in terms of time, place and person.
8. In a residential facility, ensure the staff form an outbreak management team that meets within hours of the identification of a case. The team should not be part of day-to-day facility management.
9. Identify and inform relevant internal and external stakeholders.
10. Isolate and treat individuals who test positive. Quarantine, as best as possible, those individuals who test negative and monitor for illness – persons in this group are considered to be susceptible or incubating.
11. Where feasible, commence a program of repeat tests for those (who may be) susceptible or incubating who are in quarantine. This will identify those who are pre-symptomatic to enable rapid removal from the environment.
12. Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine the exposed.

Further details about the steps

1. Define the setting

High-risk settings are defined as a setting where there is evidence of a risk for rapid spread and ongoing chains of infection. These include but are not limited to:

- Places where people reside in groups, e.g.
    - Residential settings such as aged care facilities, congregate disability accommodation, military residential groups residential, boarding schools, boarding houses, homeless shelters, correctional facilities, remote industrial

[2] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

sites with accommodation, migrant workers accommodation, remote communities.

- Workplace settings where previous outbreaks have shown large scale amplification e.g.
    - Abattoirs
    - Hospitals
    - Nightclubs and bars.

Consider if a smaller defined setting is appropriate.

The context and parameters of the outbreak may enable the definition of the setting to be a defined section of a facility. However, experiences in outbreaks in Australia indicate that at the early stage a broad definition of the setting should be used where possible; this can be scaled back later after further investigation and/or testing.

Any determination of how to define the parameters should consider any movement of staff or residents to other areas (e.g. other wards or blocks), and the potential for cases to have spread to the wider community, e.g:

- A single block of a prison or single unit in a military base
- A dormitory in a boarding school that is well separated from others

In the setting of an aged care facility, a wide definition of the setting is required at the outset because experience of transmission in these facilities is that it has been widespread and the population in the community is at risk of severe disease.

If a smaller setting is defined, the following steps should be instituted for the smaller setting. The decision to define the whole setting versus part of the setting should take into account the size of the community, availability of laboratory testing facilities and contact patterns within the community, including staffing patterns.

2. Confirm and declare an outbreak investigation

An outbreak is declared for a single confirmed case of COVID-19 in a resident, staff member or frequent attendee at the setting.

The rationale for one case being considered an outbreak is to stimulate wider immediate investigation than what may occur through routine case and contact follow-up. A single case is for the purposes of initiating an investigation but may not result in detection of subsequent cases.

Note that an outbreak is not declared if the single case is an infrequent visitor. A determination of whether someone is a frequent or infrequent visitor may be based on frequency of visits, time spent at the setting, and number of contacts within the setting.

3. Identify those most at risk of severe disease

Using the advice for people at risk of COVID-19 (https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/advice-for-people-at-risk-of-coronavirus-covid-19) identify and record those at highest risk of severe disease. If it is feasible, immediate quarantine should be implemented for those at risk of severe disease.

Arrange testing for all members of the setting for SARS-CoV-2 and other respiratory pathogens.

When an index[3] case of COVID-19 is identified who is likely to have acquired his/her infection within that setting (i.e. the case has not left the setting within the previous 14 days, or has had minimal or no contact with others outside of the setting), then it is likely that there are already other transmission chains within the setting. Testing widely should help identify those who may be shedding virus.

Consider if serological tests are available to identify persons previously infected. Note the evidence at the time about whether this indicates the person is immune or considered still susceptible.

4. **Ensure that the facility managers notify ALL staff, residents (where applicable) and visitors (if relevant), to the persons in the setting that a case of COVID-19 has occurred in the setting.**

Messaging needs to be clear that there is only one case (if applicable), but to be cautious, all members of the setting are being tested. The facility needs to take a strong leadership role with support from the PHU staff. The Australian Government Department of Health state office (https://www.health.gov.au/about-us/contact-us/state-and-territory-offices) should be engaged at the start of the outbreak, along with the Aged Care Safety and Quality Commission (https://www.agedcarequality.gov.au/).

5. **Advise staff about enhanced implementation of infection prevention and control measures and develop a process for ongoing IPC observation.**

Enhanced infection prevention and control measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities* (https://www.health.gov.au/sites/default/files/documents/2020/05/coronavirus-covid-19-guidelines-for-infection-prevention-and-control-in-residential-care-facilities_0.pdf). While the advice in these guidelines is tailored specifically to the setting of a residential care facility, the principles and actions can be applied to any setting where there is potential for rapid transmission.

Ensure all staff have completed infection control training, in person or online (COVID-19training.gov.au). Ensure that the facility appoints an IPC audit officer and that this person attends the site daily until the outbreak is over. This person's role should be observing day-to-day practices and providing advice to staff where needed. The IPC audit officer should report daily to the outbreak management team.

6. **Collate information.**

Collate information onto a line list that describes people infected in terms of time, place and person. If available, a map of the facility (such as are used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been nearer the index case. Consider diagrams for chain of infection.

[3] Index case is the first case reported to a health agency that is part of an outbreak. The primary case is the first case that occurred in the outbreak.

7. **In a residential facility, ensure the staff form an outbreak management team that meet within hours of the identification of a case. The team should not be part of day-to-day facility management.**

Guidelines about who should be members of this team can be found in the https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities

8. **Identify and ensure the staff inform relevant internal and external stakeholders**.

Because of the extended testing strategy in this outbreak investigation, messaging to other stakeholders such as families in a boarding school or aged care facility is important. Other agencies involved in the oversight of the facility should also be identified.

9. **Isolate and treat individuals who test positive**. **Quarantine, as best as possible, those individuals who test negative and monitor for illness**.

Individuals in the quarantine group are considered to be either susceptible or incubating.

10. **Where feasible, commence a program of repeat tests for those in quarantine** (susceptible or incubating persons).

This will identify those who are pre-symptomatic to enable rapid removal from the environment. Refer to Table 1.

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible
b. In subsequent rounds, only those who are PCR negative (i.e. those who are susceptible) should be tested.
c. Symptom screening should be conducted daily, for the negative (quarantined) cohort.

11. **Identify suitable sites where individuals may be cohorted together into either: isolation of the sick OR quarantine of those exposed.**

In residential settings, cohort methods of quarantine and isolation, based on symptoms and/or PCR test results, provides residents and staff with a higher level of independence within the setting, and removes barriers to care and support that are presented when individual isolation occurs. It is an important disease control intervention to manage outbreaks.

Furthermore, cohort-based quarantine and isolation for PCR positive residents reduces the amount of single use PPE required. Where possible, closed settings may consider proactive cohorting of staff and residents as an outbreak prevention measure to ensure that if there is an outbreak, it will be limited to a sub-group of residents.

Staff working at a facility with an outbreak should only work within one of the cohorts and not move between those with the disease and those in quarantine. They should not attend work at a different facility (e.g. another aged care setting, university residence) for the duration of the outbreak. Staff should be regularly screened for symptoms in addition to participating in whole of setting testing.

Table 1. Testing and ongoing actions for the individuals in the defined setting.

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort On Retest Day/s**
Recommended testing and actions	Test all members of the setting via PCR Isolate positive persons (may designate an area to cohort positive cases) Quarantine cohort of negative community members (an off-site quarantine site may suit depending on the setting)	**Whom to test** Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** Isolate positive persons Quarantine cohort of PCR negative community members & screen for symptoms	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

Release from isolation

Release from isolation for cases should be according to the appropriate release from isolation criteria. If the setting involves older Australians, it may be difficult to determine when the person is symptom free because of comorbidity. If it is difficult to identify symptom free days, two negative PCR swabs 24 hours apart indicate the case can be released from isolation.

Consideration of source of introduction of disease (upstream investigation)

This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

Staff

Staff working in a facility or community where an outbreak is occurring should not attend work at a different facility (e.g. another aged care setting, university residence) until the outbreak is declared over. Staff should be regularly screened for symptoms and/or tested during an outbreak. PHU should consider this for all staff, including anyone who works on site (e.g. cleaners, visiting staff, contractors, etc.).

All staff should self-monitor for signs and symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used.

The setting should maintain a register for all staff and visitors to check for symptoms and the occurrence of fever at the beginning of every shift, in addition to regular visitor register protocols.

Once isolation of infected persons is in place, to further reduce the risk of transmission, specific staff should be allocated to support/care for PCR positive isolated residents. The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for infection prevention and control and correct use of PPE.

Declare that the outbreak is over

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over. In most circumstances, an outbreak can be declared as over 14 days post isolation of the last case.

Once the outbreak is over, PHU should ensure that cluster reports are provided to relevant stakeholders and that data is summarised appropriately.

Healthcare

All healthcare workers should observe usual infection prevention and control practices in the workplace. This includes healthcare workers and other staff in any setting who have direct patient contact.

Healthcare workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results. Healthcare workers who are defined as close contacts should be treated as such (refer to Management of contacts).

In settings where the loss of the healthcare worker will have a significant impact on health services, an individual risk assessment should be conducted in collaboration with the PHU.

Quarantined healthcare worker close contacts should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals.

PHU may assist infection control units of health facilities to identify and monitor healthcare worker close contacts.

It is recognised that clinical work restrictions on close contacts who are healthcare workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring healthcare workers implement appropriate infection control precautions when assessing and managing confirmed and suspect COVID-19 cases.

Staff (including Healthcare workers) who have direct patient contact in a hospital or residential/aged care facility.

Healthcare workers and other staff with close patient contact who work in hospitals or residential/aged care facilities should take additional precautions because they come into contact with a high caseload of potentially vulnerable patients.

Healthcare worker exposures in the context of PPE use

Where the healthcare worker (HCW) and/or case are using PPE, a risk assessment should be performed to determine whether the contact should be designated as a close contact and quarantined for 14 days (see Tables 2a and 2b). Factors that may be considered include:

- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, wandering).
- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Note: exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Continue to work • HCW to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the HCW, and return of a negative result, prior to continuation of work.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in healthcare settings and Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (https://www.health.gov.au/resources/publications/cdna-national-guidance-for-remote-aboriginal-and-torres-strait-islander-communities-for-covid-19).

Key drivers of increased risk of transmission and severity

- **Mobility:** Aboriginal and Torres Strait Islander peoples are highly mobile, with frequent travel often linked to family and cultural connections and community events involving long distances between cities, towns, and communities. In addition, remote communities have a high flow of visitors (e.g. tourists, fly-in fly-out clinicians and other workers). This increases the risk of transmission even in generally isolated communities.
- **Remoteness:** A fifth of the Aboriginal and Torres Strait Islander population lives in remote and very remote areas. There is often reduced access health services, these are usually at capacity in normal circumstances and are often reliant on temporary staff. Limited transport options may further inhibit presentations and delay laboratory testing.
- **Barriers to access:** Unwell people may present late in disease progression for many reasons including lack of availability of services, institutional racism, and mistrust of mainstream health services.
- **Overcrowding:** Many Aboriginal and Torres Strait Islander communities have insufficient housing infrastructure, which results in people living in overcrowded conditions. This facilitates disease transmission and makes it difficult for cases and contacts to maintain physical distance measures and self-quarantine.
- **Burden of disease:** Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times the rate of other Australians. This may increase the risk of severe disease from SARS-CoV-2.

Key response strategies

- **Shared decision-making and governance:** Throughout all phases, COVID-19 response work should be collaborative to ensure local community leaders are central to the response. Further risk reduction strategies and public health responses should be co-developed, and co-designed, enabling Aboriginal and Torres Strait Islander people to contribute and fully participate in shared decision-making.
- **Social and cultural determinants of health:** Public health strategies should be considered within the context of a holistic approach that prioritises the safety and well-being of individuals, families and communities while acknowledging the centrality of culture, and the addressing racism, intergenerational trauma and other social determinants of health.
- **Community control:** The Aboriginal Community Controlled Health Services (ACCHS) sector provides a comprehensive model of culturally safe care with structured support and governance systems. The network of ACCHS and peak bodies should be included in the response as a fundamental mechanism of engagement and communication.
- **Appropriate communication with the community:** Each community action plan should contain recommendations for communication within the community. These should be implemented as agreed by community–controlled organisations. Messages should be strengths-based and encompass Aboriginal ways of living, including family-centred approaches during both prevention and control phases. They should address factors that may contribute to risk such as social determinants of health, including living arrangements and accessibility to services.

- **Clinical Communication:** Public health officers should immediately alert other health services in the region and the regional town that there is a suspect case (if this is thought likely to be confirmed) or if there is a confirmed case. This should include services in other jurisdictions if there is regular travel between these communities.
- **Education of confirmed and suspect cases:** Suspect cases should be offered education on why isolation is required to protect others and how this can be done within a household as well as social and cultural support. This should be ongoing if the case is confirmed**.** All contacts should be provided with an explanation of COVID-19, ample opportunity to ask questions; informed about the community response plan including quarantine options and why it is important that they quarantine themselves to protect others**.**
- **Flexible and responsive models of care:** Consider flexible health service delivery and healthcare models (e.g. pandemic assessment centres, flexible ACCHSs clinic hours/location with additional staffing, and home visits). Consider employing the use of point of care influenza tests, where available, to help determine whether influenza is implicated in presentations in the community.
- **Isolation and quarantine:** Families should feel empowered and be part of decision-making around quarantine. This can be achieved through exploring with families what quarantine looks like, working through how it might impact on the family and their way of living, and identifying ways around it. Family members will want to visit unwell people in hospital. It should be made clear that there are other ways to be with sick family members in hospital, maintain communication with families and communities in lieu of gatherings (e.g. staying socially connected through the internet and video calling).

Residential group settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities (available at: https://www.health.gov.au/resources/publications/coronavirus-covid-19-guidelines-for-outbreaks-in-residential-care-facilities). The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Correctional and detention facilities

Correctional and detention facilities are likely to be at increased risk for significant transmission of COVID-19. This is due to high-density shared living arrangements where inmates are often located in close proximity and logistical and practical difficulties involved in implementing physical distancing. Visitors, inmates and staff moving between the facility and the community, and inmate transfers between facilities, represent potential routes of introducing infection into correctional and detention facilities.

Preventive measures

Consider zoning or cohorting of staff, inmates and essential prison services (e.g. food service, laundry, cleaning) so that if a case occurs, the number of close contacts is a fraction of the people in the facility, not everyone. Correctional and detention facilities should educate staff, inmates and visitors to inform their behaviour and promote preventive measures. Staff, inmates and visitors should be encouraged to self-screen for symptoms, practise good personal hygiene, and practise physical distancing where possible.

If staff or visitors are unwell, they should not enter the facility, and facilities should consider the use of a screening tool for visitors and/or staff. If inmates are unwell with COVID-19 symptoms, SARS-CoV-2 testing should be arranged.

Unwell inmates should be kept separate from others until results are available and/or symptoms have resolved. Facilities should undertake regular environmental cleaning and should ensure hygiene supplies such as soap are readily available for inmates and staff. Precautions should be taken when transferring inmates between facilities and when admitting new inmates to a facility, with screening processes in place. Early detection, testing and isolation of symptomatic inmates is essential. For more information, refer to section 3.2 of the *CDNA National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

Outbreaks

Correctional and detention facilities may already have frameworks and protocols in place for testing and isolation in the event of a disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *National Guidelines for the Prevention, Control and Public Health Management of COVID-19 Outbreaks in Correctional and Detention Facilities in Australia*.

People with disability

Some people with disability will be at greater risk throughout the COVID-19 pandemic. This is due to:

- Risk of more serious illness if infected by COVID-19.
    - There is a high prevalence of comorbidities amongst people with disability, including chronic conditions and weakened immune systems.
    - Additionally, people with disabilities can have unrecognised, untreated or poorly managed physical or mental health conditions.
- Challenges involved in preventative measures.
    - Physical distancing can also be difficult or impossible for some people with disability. This includes those who rely on support and assistance from family members, carers and support workers.
    - Some people with disability also face barriers to implementing basic hygiene measures and safely wearing face masks. These factors put many people with disability and those that support them at higher potential risk of exposure to the virus.
    - Barriers to adequate deep nasal swabs for PCR.

Some people with disability live at home by themselves, others live with family members, or in congregate disability accommodation such as group homes or larger facilities.

Congregate disability accommodation settings are high-risk settings for infectious disease outbreaks due to higher density living, close physical contact between staff and participants, and large number of visitors and staff moving between the community and facilities.

Such settings require increased levels of risk mitigation and support to prevent COVID-19 transmission.

Preventative measures

In addition to usual preventative protocols, congregate disability accommodation should ensure that people with disability and support staff are encouraged to increase their frequency of hand hygiene (with soap and water or using alcohol hand rub), surface cleaning, and to use correct cough/sneeze etiquette. Consideration should be given to the communication and support needs of the person with disability, and reasonable adjustments should be made as required. Information should be provided in accessible formats such as Easy Read and Auslan.

Messaging to discourage unwell visitors from visiting people with disability in congregate accommodation should be reinforced, and care should be taken to ensure unwell staff and volunteers know not to present to work while symptomatic with any infectious condition.

Outbreaks

Outbreaks of COVID-19 in congregate disability accommodation settings should be managed with reference to the Coronavirus (COVID-19) guidelines for outbreaks in residential care facilities. The guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia, noting that a supplementary appendix is currently being drafted to address the specific needs of smaller residential care homes or congregate disability accommodation settings.

Hotel quarantine

Jurisdictions are recommended to conduct regular testing of staff who work in COVID-19 quarantine and isolation settings who are at risk of exposure to COVID-19. Workers who are at higher risk are recommended to be tested at least every 7 days. The risk of exposure should be determined by those managing the quarantine/isolation setting (e.g. a Public Health Unit).

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers, ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may also determine appropriate methods for routine testing, which may include alternative testing methods (e.g. saliva).

Please see AHPPC statement on COVID-19: Routine Testing of Hotel Quarantine Workers.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including, production line work in close proximity to others: limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control within the facility.

7. Special situations

Aircrew

Testing and quarantine

Aircrew flying on international flights are required to be tested on arrival or undergo a COVID-19 test in Australia every 7 days, as directed by individual jurisdictions.

International aircrew arriving into Australia, who are not Australian-based (ie. local residents), need to quarantine in a dedicated quarantine facility either between international flights or for 14 days, whichever is the shortest. Aircrew who are local residents and who enter Australia in their state of residence may be allowed to quarantine at home for 14 days or until their next international flight. For more information, see Australian Health Protection Principal Committee (AHPPC) statement on safe air travel – enhancing end-to-end mitigations – international.

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew should be managed as primary close contacts.

Considerations for conducting a risk assessment should include:

- Infection prevention and control, including appropriate use of PPE
- Variants of concern
- Proximity of crew to confirmed cases
- Duration of exposure to confirmed cases
- Size of the compartment in which the crew member and confirmed case interacted
- The number of confirmed cases of COVID-19 on board
- Potential breaches of PPE

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as primary close contacts.

Where it has been determined that a crew member is a primary close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix B: Risk assessment and identification of close contacts in aircrew.

Management of aircrew

Please see Appendix C: Guidance on the management of aircrew for information on management of aircrew including:

- Aircrew who test positive for SARS-CoV-2 in Australia;
- Aircrew who are a close contact of a person with confirmed COVID-19;
- Returning aircrew who are primary close contacts;
- Aircrew with historical infections; and
- Onward domestic travel of aircrew who are Australian residents.

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All returned travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at Safe Work Australia's COVID-19 information for workplaces or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances **where all alternative surge workforce strategies are exhausted** and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (44). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Risk assessment and identification of close contacts in aircrew

Appendix C: Guidance on the management of aircrew

Appendix D: Organ donation and transplantation

Appendix E: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are primary close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew primary close contacts. For more information on contact tracing of aircraft passengers see Close Contacts and Special situations.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify primary close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a primary close contact:
    - Face-to-face contact of any duration with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as primary close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHU should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as primary close contacts.

Additional considerations for conducting a risk assessment should include:

1. Variants of concern
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

2. Proximity of crew to confirmed cases
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered primary close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. Duration of exposure to confirmed cases
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered primary close contacts.

4. Size of the compartment in which the crew and confirmed case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered primary close contacts.

5. The number of confirmed cases of COVID-19 on board
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. Potential breaches of PPE
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered primary close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered primary close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

Aircrew and passengers who are primary close contacts

If an airline becomes aware of a crew member or passenger who was a primary close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix C: Guidance on the management of aircrew.

Appendix C: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified **should remain in isolation in Australia** until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 **can be permitted to leave Australia** if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can be permitted to return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 **should not be permitted to return to Australia within 14 days of their onset of symptoms** and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact **should not be permitted to return to Australia within 14 days of their last known exposure** to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Air crew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 **are permitted to travel onto their jurisdiction of residence** if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix D: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (45-48).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (45).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals available at https://tsanz.com.au/information/covid-19.htm

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see PHLN guidance on laboratory testing for SARS-CoV-2).

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix E: Full revision history of the COVID-19 SoNG

Revision history			
Version	Date	Revised by	Changes
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new

			Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.

2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.

1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.

1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 4.4
11 May 2021

Summary of revision history

For full revision history, please refer to Appendix F

Summary of revision history			
Version	Date	Revised by	Changes
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	04 March 2021	Communicable Diseases Network Australia	Inclusion of new section: Appendix C Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: The Disease; Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variants of concern.
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status. All newly confirmed cases should undergo whole genome sequencing.

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information, see Identification of potential source contacts.

Contact management

Close contacts should be managed according to management of contacts guidance.

Primary close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period, regardless of vaccination status. Primary close contacts should be actively monitored for development of fever or COVID-19 symptoms during this period, where feasible, and should be tested if symptoms develop. Primary close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

Routine testing is required for international travellers, international aircrew, COVID-19 quarantine and isolation facility workers and primary close contacts in quarantine.

For detailed guidance on laboratory testing for SARS-COV-2, please refer to *Public Health Laboratory Network Publications*.

2. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 80% sequence identity to SARS-CoV-1 (1, 2).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (3).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (4). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (4).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures), in the context of certain behaviours, such as singing and shouting (5) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (4). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (6, 7). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (8).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4 (9). R_0 for confined settings may be at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (10, 11).

Aerosol-generating procedures and particulate filter respirators

Appropriate care should be taken during aerosol-generating procedures. Airborne precautions, including the use of a particulate filter respirator (PFR), are required when performing aerosol-generating procedures on confirmed or suspected cases of COVID-19. Examples of aerosol-generating procedures include bronchoscopy, intubation, suctioning etc. in hospital settings. Listed examples of aerosol-generating procedures are available in the ICEG *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak*. Use of nebulisers should be avoided, where possible, and alternative administration devices (e.g. spacers) used for the administration of medication.

PFRs should also be considered in preference to a surgical mask in certain specified clinical settings. Staff who use PFRs should be trained in their correct use, including donning, doffing, and fit-checking at each use. For further information on the correct use of PFRs, see the ICEG guidance *The use of face masks and respirators in the context of COVID-19*.

The Testing section provides detailed information on appropriate PPE for sample collection for SARS-CoV-2.

SARS-CoV-2 variants of concern or interest

All viruses, including SARS-CoV-2, change over time. Most mutations won't significantly alter the behaviour of the virus. However occasionally, changes may provide either a biological advantage or disadvantage to virus propagation (12).

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (13, 14). Lineages for which there is no clear evidence that the mutations confer a change in the disease may be denoted 'variants under investigation' or 'variants of interest'. For more information please see: *PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

Some SARS-CoV-2 VOC have demonstrated the potential for escape from immune recognition. In vitro studies of some variants with the E484K mutation have shown evasion of neutralising antibodies in convalescent sera of individuals previously infected with non-variant SARS-CoV-2. Further studies are required to understand the impact of VOC on the risk of re-infection and vaccine effectiveness (15, 16).

The Communicable Diseases Genomics Network is actively monitoring variants and their reported mutations to understand how these may influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see *ICEG statement on infection prevention and control implications of highly transmissible SARSCoV-2 variants*.

Incubation period

The majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (17-19). Around 1% of COVID-19 cases will develop symptoms more than 14 days after exposure (20). The advice in this guideline uses an upper range of 14 days to guide public health measures such as quarantine and isolation. There is currently insufficient high-quality evidence to determine how the incubation period for emerging variants of concern may differ from other lineages.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (21, 22). Pre-symptomatic transmission can occur 1-3 days before symptom onset (23, 24). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (25).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (22). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (25). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (26).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the public health unit (PHU). Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (27-29). Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (1, 27-29). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (30).

The clinical presentation of COVID-19 differs from influenza, as the former typically presents with fever, then cough followed by myalgia, headache, and sore throat while the latter more commonly initiates with cough (31).

Recent studies have reported the clinical characteristics of patients with COVID-19. Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (32, 33). Older adults are at increased risk of severe disease compared with younger individuals due to age-related vulnerabilities (34, 35). While those with comorbid conditions have a higher incidence of severe or fatal outcomes, there are few studies investigating the relationship between severity and mortality of COVID-19 in the context of comorbidities (33).

COVID-19 is generally a mild disease in children, with the risk of severe disease being almost 25 times greater in adults (36, 37). A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (38).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (21, 22, 39-42).

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (43). Reported long-term symptoms, include fatigue, headache, attention disorder, mood changes, chest pain, palpitations, hair loss, and dyspnoea (43, 44). Fatigue is the most common long-term symptom affecting around 58% of individuals (43). For individuals who experience loss of smell and/or taste as a result of COVID-19, most regain these senses within the first 28 days following infection but up to a quarter experience longer-lasting dysfunction (45). Long-term symptoms following COVID-19 are more likely with increasing age, body mass index and female sex (46).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.1% (47). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems on patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is 3.1% (based on surveillance data notified in Australia as of 03 May 2021). Outbreaks in residential aged care facilities have contributed to Australia's slightly higher CFR compared with the global average due to the older age and higher rates of comorbid illness among those infected. To date, 75% (685/910) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data notified in Australia as of 03 May 2021).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (48).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (48). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (15, 48).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (15). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (15). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Vaccination

The SARS-CoV-2 vaccination program commenced in Australia on 22 February 2021. The Therapeutic Goods Administration has approved AstraZeneca ChAdOx1-S and Pfizer Australia - COMIRNATY BNT162b2 (mRNA) vaccines for distribution within Australia. Currently available evidence demonstrates that both AstraZeneca and Pfizer vaccines are effective in reducing the incidence and severity of COVID-19 (49).

It is not yet clear how widespread vaccination will affect the risk of SARS-CoV-2 transmission. Additionally, evidence is still emerging on vaccine effectiveness, including effectiveness following first and second doses (50).

The Australian Technical Advisory Group on Immunisation (ATAGI) has noted evidence of a rare but serious side effect involving thrombosis (clotting) with thrombocytopenia (low blood platelet count) following receipt of the AstraZeneca vaccine. ATAGI recommends the Pfizer vaccine as the preferred vaccine for adults aged under 50 years. For more information, see *ATAGI statement on AstraZeneca vaccine in response to new vaccine safety concerns*.

The safety and effectiveness of COVID-19 vaccination programs in Australia and overseas is being monitored closely in the context of how vaccination may impact upon the optimal public health management of COVID-19.

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or

working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas);
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

Disease occurrence and public health significance

Cases of COVID-19 were initially thought to be associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 10 May 2021, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 157.9 million confirmed cases and over 3.2 million deaths (47).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (51), and declared a pandemic on 12 March 2020 (52).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The *Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19)* details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the *Biosecurity (Listed Human Diseases) Determination 2016* as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the Australian Health Protection Principal Committee. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas

travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

3. Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. See *COVID-19 FAQs- international travellers to Australia*.

Jurisdictions will also conduct testing in COVID-19 quarantine and isolation facilities, for more information see Testing section.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practising effective hand hygiene and respiratory hygiene;
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants;
- Staying home and not attending public places including work or school if unwell;
- Maintaining a distance of 1.5 m from people when in public; and
- Wearing a face mask in situations where physical distancing cannot be maintained.

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

During outbreaks or in the presence of sustained community transmission, the use of masks in the community can supplement other control measures. See the ICEG guidance *Are cloth face masks likely to provide protection against COVID-19?*

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to 'stay at home' requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

4. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

5. Cases

Definitions

The rationale for the current case definitions is to ensure appropriate reporting, case management and public health follow up of people who could potentially transmit SARS-CoV-2.

Please refer to the Testing and Case Management sections for advice on who to test and recommended public health follow up actions for confirmed, historical or suspect cases.

Confirmed case

A confirmed case requires laboratory definitive evidence (where not classified as a historical case).

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

   OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

   OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Historical case

A historical case requires laboratory suggestive evidence AND either:

i. previous (prior to the past 14 days) clinical evidence OR

ii. previous (prior to the past 14 days) epidemiological evidence.

A historical case should not have symptoms of COVID-19 (or not have had symptoms of COVID-19 for the past 14 days).

Laboratory suggestive evidence:

1. Detection of SARS-CoV-2 by polymerase chain reaction (PCR) on two specimens at least 24 hours apart with results suggestive of a historical infection[3] on both specimens AND detection of IgG or total antibody, in the absence of vaccination[2,4];

   OR

2. Negative SARS-CoV-2 PCR AND detection of IgG or total antibody, in the absence of vaccination[2];

   OR

3. Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3] AND a subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence:

Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills) OR acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] OR loss of smell or loss of taste.

Epidemiological evidence:

- Close contact with a confirmed case (refer to Close contacts below)
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services
- International border staff
- Air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2.

For more information on the steps for determining a historical infection, please see Release from Isolation.

Suspect case

A person who meets the above clinical AND epidemiological criteria:

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and/or patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

Reporting

Confirmed cases should be notified in the jurisdiction of diagnosis and reported to the National Notifiable Diseases Surveillance System, except if previously diagnosed overseas or in another Australian jurisdiction.

Historical cases should be notified in the jurisdiction of diagnosis and reported to the National Notifiable Diseases Surveillance System, except if previously diagnosed overseas or in another Australian jurisdiction as a confirmed case.

People who have previously been diagnosed and managed overseas or in another Australian jurisdiction do not need to be notified as a confirmed or historical case. In this situation, the person should provide documented evidence of diagnosis overseas/interstate to the PHU.

Notes:

[1] There is possibility for false negative PCR results in children, as some children may be found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (53). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[3] PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

The Ct value of a reaction is the cycle number when the fluorescence of a PCR product is first detected above the background signal. The lower the Ct value, the more virus is present in the sample being tested, as fewer amplification cycles are required before the threshold for detection is met. A high Ct value generally indicates that it takes longer i.e. more cycles to detect the virus, indicating that there is less viral RNA present in the sample. Each PCR assay may have a different Ct value that is used for detecting SARS-CoV-2. Ct values for one in-vitro diagnostic (IVD) device should not be compared with Ct values from other platforms. This means there is no 'set' Ct value to aim for across all platforms. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, or results are ambiguous, interpretation of PCR results suggestive of a historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

To guide local approaches to testing, please refer to the *CDNA and PHLN Testing Framework for COVID-19 in Australia* (Testing Framework). The Testing Framework identifies key priority groups for targeted testing based on the likelihood of infection and the epidemiological situation. The Testing Framework also provides guidance on appropriate test types based on specific circumstances. Jurisdictions can apply this guidance according to their local context.

Infection prevention and control precautions

In the context of specimen collection for SARS-CoV-2 testing, the infection prevention and control precautions below represent the minimum national standard. Jurisdictions may undertake risk assessment to determine whether a higher level of PPE may be required, based on individual circumstances, including local epidemiology of COVID-19.

All jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures and guidance, see *ICEG-endorsed infection control guidance*.

Minimum infection prevention and control precautions for SARS-CoV-2 specimen collection:

- Perform hand hygiene
- Use gloves[1], gown, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/ disinfectant wipe in between uses by the same person.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the area.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
    - You can wear the same gown to collect specimens from more than one patient in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Note:

[1]Vinyl gloves are not recommended for the clinical care of residents in the context of COVID-19. Powder-free latex or nitrile gloves are accepted as superior in clinical care and are less likely to be breached compared with vinyl gloves. Gloves should be selected and worn in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*.

For information specific to SARS-CoV-2 variants of concern, see Infection prevention and control implications of highly transmissible SARS-CoV-2 variants.

Approach to specimen collection and testing for SARS-CoV-2

Laboratory testing for SARS-CoV-2 is important for individual patient diagnosis, and to guide infection prevention and control procedures and public health investigations. The main sample types submitted for testing are respiratory tract samples (upper and lower tract) and sera. Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) is the method of choice to detect SARS-CoV-2 during the acute illness.

Serology may be useful for diagnosis of historical COVID-19 cases, further investigation where nucleic acid testing is negative, and research purposes. However, currently no serological assays can reliably prove immunity to SARS-CoV-2 and the ability of serology to detect anti-spike antibody following vaccination for COVID-19 is unknown. The detection of anti-spike antibody cannot distinguish between natural infection and vaccination. Routine diagnostic serological testing is not recommended following COVID-19 vaccination.

Routine tests for acute pneumonia/pneumonitis should be requested where indicated and according to local protocols. This may include bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for other respiratory pathogens.

The occurrence of viral coinfection in SARS-CoV-2 has been negligible in Australia to date. However, if SARS-CoV-2 is not detected, testing for other common respiratory viruses in a person with an acute respiratory tract infection may be clinically appropriate.

For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; or the different types of SARS-CoV-2 specific testing, please refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Refer to *PHLN guidance on laboratory testing for SARS-CoV-2* and Genome sequencing for all cases for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, OR acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak.*

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions will conduct routine testing of international travellers who are in hotel quarantine. Testing should occur on day 0–2 and then on day 10-14, preferably as late as possible, of hotel quarantine, with results to be received prior to release from quarantine period. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – international travellers.

COVID-19 quarantine and isolation facility workers

All COVID-19 quarantine and isolation facility workers (e.g. health staff concierge, transport staff, police, security guards, cleaners etc.) are required to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHU should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Post testing instructions and isolation requirements for people with symptoms that may be due to COVID-19

Jurisdictions should give clear instructions on isolation requirements after COVID-19 testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

Individuals must follow all relevant post-testing instructions regardless of vaccination status.

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Factors to consider

Post-testing instructions and the level of isolation required after testing should consider the following factors:

- Epidemiological context
- Whether the person is symptomatic
- Potential risk of transmission of undiagnosed COVID-19
- The public health risk of creating a barrier to testing

Post-testing instructions and isolation requirements

PHUs may divide instructions on isolation requirements after testing into two groups:

1. People with a clinically compatible illness who are not in quarantine
2. People with a clinically compatible illness who are in quarantine

1. For people with a clinically compatible illness who are not in quarantine:
   - The person should stay at home until a negative test is returned AND symptoms have resolved[1].
   - Whilst staying at home and waiting for a negative test, they should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
   - Their household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions when <u>there is community transmission:</u>
   - Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
   - Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

2. For people with a clinically compatible illness who are in quarantine:
   - The person should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
   - They must remain in quarantine for the pre-determined period as determined by the relevant PHU, regardless of negative test result.

<u>Notes</u>:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a

setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is when there is a lack of an epidemiological risk factor for acquisition of COVID-19, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the PHUs first contact the laboratory microbiologist to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in close collaboration with the laboratory microbiologist and the treating clinician:

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.

2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA

3. Immediately collect another respiratory specimen for PCR testing, where feasible.

4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.

5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from primary close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed or suspect cases:

Begin follow up investigation of confirmed or suspect cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Case interviews, exposure site identification and primary close contact identification should be completed within 1 day of notification of a confirmed case.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Historical cases:

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined that the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information see Identification of potential source contacts.

Response procedure

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 (54, 55), whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case.
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Record vaccination status including vaccine type, date and country of administration.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing, aiming for identified primary close contacts to be placed in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities as transmission between humans and animals has been observed (56).

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- There is a reasonable level of confidence of the compliance of the case.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. See Release from isolation for further information.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection prevention and control precautions, pending further testing (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are primary close contacts or are required to quarantine for other purposes (e.g. international travel) must continue to quarantine for the remainder of the 14-day period, regardless of any negative test results. Refer to Management of contacts for further information.

In addition to standard precautions, including hand hygiene (5 Moments), the recommended minimum standard for the use of PPE during clinical care of people with confirmed or suspected COVID-19 are:

- Contact and droplet precautions for routine care of patients with confirmed or suspected COVID-19.

- Contact and airborne precautions when performing aerosol-generating procedures, and in other specified clinical circumstances. Refer to *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak* and *Recommended minimum requirements for the use of masks or respirators by health and residential care workers in areas with significant community transmission of COVID-19* for further information.

Jurisdictions may undertake risk assessment to determine whether a higher level of PPE may be required, based on individual circumstances, including local epidemiology of COVID-19. For detailed guidance on infection prevention and control precautions for clinical care of people with confirmed or suspected COVID-19, see the ICEG *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak* and ICEG *Guidance on the use of PPE in non-inpatient health care settings, during the COVID-19 outbreak*.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another organism.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, a full respiratory panel for other pathogens should be done.

The following criteria can be used to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHU and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, interpretation of PCR results suggestive of a historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.
[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Confirmed cases known to be due to SARS-CoV-2 which is not a variant of concern and who do not meet historical infection criteria

The following information details the circumstances under which confirmed cases *not infected* with a SARS-CoV-2 variant of concern, as confirmed by whole genome sequencing, can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of the respiratory symptoms of the acute illness and fever for the previous 72 hours[1,2]

b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

The case can be released from isolation if they meet both of the following criteria [2]:

- at least 20 days have passed since the onset of symptoms; and
- the case is not significantly immunocompromised[4]

OR

The case can also be released from isolation if they meet all the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
- the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In addition to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture, serology results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and

human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of available evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (57-59). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a primary close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to all cases upon release from isolation.

Confirmed cases who do not meet the criteria for a historical infection and are infected with a SARS-CoV-2 variant of concern or unknown variant

The following information details the circumstances under which confirmed cases *infected with a SARS-CoV-2 variant of concern* as confirmed by whole genome sequencing, can be released from isolation.

These criteria also apply to confirmed cases who:

1. do not meet the criteria for release from isolation as a historical infection; and
2. are infected with an unknown SARS-CoV-2 variant. This includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern.

All cases *must* fulfil the following criteria to be considered for release from isolation:

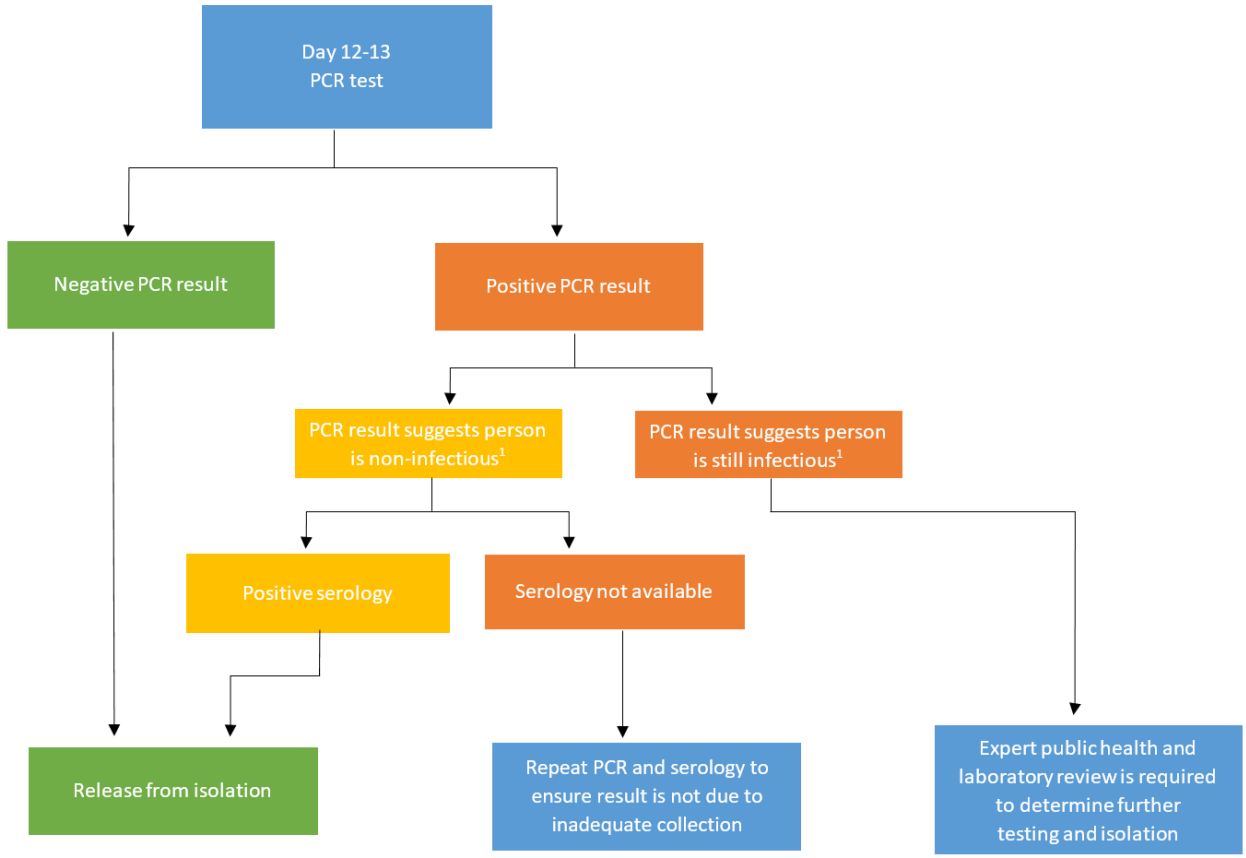
- at least 14 days have passed since the onset of symptoms or positive PCR if asymptomatic; and

- there has been clinical resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours.

In addition to the above criteria, cases must have a respiratory specimen for SARS-CoV-2 by PCR taken at day 12-13 from symptom onset (or from the first positive PCR date for asymptomatic cases). Cases should be managed as follows:

- If the day 12-13 PCR is negative, the case may be released from isolation, regardless of serology result; or
- If the day 12-13 PCR is positive but PCR results suggest they are non-infectious[1] AND spike or neutralising antibodies are also present, then the case can be released from isolation.
- If the day 12-13 PCR is positive but PCR results suggest they are non-infectious[1], and serology is not available or is negative, a repeat PCR could be performed (to ensure the result was not due to inadequate collection) and serology could be repeated, if available.
- If the day 12-13 PCR is positive and PCR results suggest they are still infectious[1], regardless of any serology result, expert public health and laboratory review is required to determine further testing and isolation.

Figure 1: Decision tree for COVID-19 cases infected with a variant of concern/unknown



Note:

[1] Interpretation of PCR results with regard to a case's potential stage of infection may include consideration of cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, interpretation of PCR results should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

6. Contacts

Close contact definitions

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. In a setting of limited or no community transmission, the following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

A primary close contact is anyone who has had unprotected exposure to a confirmed case. Identifying people who are secondary close contacts of those primary contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Identification of secondary contacts may be more applicable in household settings; situations where there are communication challenges with contacts; where the primary close contact may already be infected; settings where there may be delays in receiving testing results (e.g. remote settings); or where secondary contacts work in settings where there is a high transmission risk (e.g. residential aged care).

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious (refer to Release from isolation).
- the exposure may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)
- been exposed to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for returned travelers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts

Contact needs to have occurred within the infectious period of the case: a period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings, at the discretion of the PHU.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not generally considered to be primary

close contacts, provided that appropriate PPE has been worn and there has not been any breaches.

- For aircraft passengers, passengers who were seated in the same row or two rows in front or behind a confirmed case are considered primary close contacts in most instances. Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport. If the confirmed case was infected with a SARS-CoV-2 variant of concern, PHUs may consider classifying all passengers on board the flight as primary close contacts. Similar criteria can be used for people who have had close contact on bus or train trips.
- For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify which crew members should be considered primary close contacts. Refer to Special situations and Appendix C for further information.
- For more information about close contacts in different settings, refer to Special situations and Appendix C.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact

At the discretion of the PHU, some casual contacts may be classified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to people who do not meet the primary close contact definition (e.g. in restaurants, pubs, places of worship). The following factors should be considered prior to classifying casual contacts as primary close contacts:

- Epidemiological context, risk tolerance and level of community transmission
- Potential for the venue or setting to result in large scale amplification
- Jurisdictional capacity and resourcing requirements, including potential opportunity costs
- Adequate translation services, culturally-appropriate resources and engagement with community leaders, where appropriate

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact in any setting with a primary close contact from 24 hours after the primary contact's exposure to the case
- the exposure to the primary close contact may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

Primary close contacts:

- are required to quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- should be advised to monitor their health. PHUs should conduct active daily monitoring of primary close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case, during the case's infectious period.
- should be advised on the processes for seeking medical care, including on how to safely seek testing for COVID-19. Refer to Medical care for quarantined individuals.
- should be tested during the quarantine period. At a minimum this should occur
    - On entry to quarantine – a positive test result would make the primary close contact a case and support a decision to move the person to an alternative place for isolation and would also bring forward contact tracing for that person
    - If symptoms of COVID-19 develop
    - Before exit from quarantine (where appropriate)
        - For household and individually identified close contacts, and all other close contacts considered to be at higher risk of infection, finding a positive test result late in the quarantine period (e.g. day 10–12) of a primary close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community.
        - Exit screening is particularly important if the primary close contact is associated with a high risk setting or if the timing of potential exposure is likely to see infection develop later in the quarantine period.
        - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

Casual contacts

Casual contacts should be provided with information about their exposure and need to monitor for symptoms and seek testing if symptoms develop. Depending on the circumstances, they may be asked to attend for asymptomatic testing.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. exposed at a high-risk setting such as abattoir or hospital);
- The secondary contact has had extensive and/or ongoing exposure to the primary contact (e.g. living in the same household);
- There was a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary contact to become infectious prior to quarantine); or
- Secondary transmission has already occurred from a primary close contact to a secondary close contact.

Secondary close contacts should be quarantined until the PHU is certain that the primary close contact was not infectious at the time of last contact with the secondary close contact (i.e. the primary contact returns a negative test result, or the exposure time is not consistent with transmission) and contact with the primary contact is not ongoing.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may particularly be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix B: Outbreak investigation and management).

International travellers

International travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. For more information, see COVID-19 FAQs-international travellers to Australia.
All international travellers, with the exception of travellers from New Zealand in some jurisdictions, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. International travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined international travellers should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals. All international travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others (if they are quarantining with other people) should they become unwell. This advice should be followed for 14 days after returning from overseas/interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10-14, preferably as late as possible, of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the international traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the international traveller should be isolated and managed as per the recommendations for confirmed cases.

All international travellers who have undertaken international travel in the last 14 days who are unwell with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Health and residential care workers

Health and residential care workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results.

Infection prevention and control units of health and residential care facilities may assist PHUs to identify and monitor health and residential care worker close contacts.

It is recognised that clinical work restrictions on primary close contacts who are health or residential care workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring health and residential care workers implement appropriate infection prevention and control precautions when in close contact with confirmed and suspect COVID-19 cases. For detailed guidance on infection prevention and control, please refer to Infection Control Expert Group-endorsed infection prevention and control guidance.

In settings where the loss of the health and residential care worker will have a significant impact on health or residential care services, an individual risk assessment should be conducted in collaboration with the PHU.

Risk assessment of health and residential care workers

Where there are concerns regarding appropriate PPE use by the health or residential care worker and/or the case, a risk assessment should be performed to determine whether the contact was sufficient to warrant treatment as a primary close contact or a casual contact (with potential for testing and/or quarantine), see *Tables 2a* and *2b* below. Factors that may be considered include:

- Details of related transmission events in the outbreak.
- Vaccination status.
- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, singing, wandering).
- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed without appropriate PPE use.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Notes:

1. PHU should consider vaccination status as a component of risk assessment.
2. Exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Test and isolate until result received • Continue to work if negative • Health or residential care worker to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the health or residential care worker, and return of a negative result, prior to continuation of work.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who may be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19 case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as

soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

7. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control measures within the facility.

8. Special situations

Aircrew

Testing and quarantine

Aircrew flying on international flights are required to be tested on arrival or undergo a COVID-19 test in Australia every 7 days, as directed by individual jurisdictions.

International aircrew arriving into Australia, who are not Australian-based (ie. local residents), need to quarantine in a dedicated quarantine facility either between international flights or for 14 days, whichever is the shortest. Aircrew who are local residents and who enter Australia in their state of residence may be allowed to quarantine at home for 14 days or until their next international flight. For more information, see *Australian Health Protection Principal Committee (AHPPC) statement on safe air travel – enhancing end-to-end mitigations – international*.

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew should be managed as primary close contacts.

Considerations for conducting a risk assessment should include:

- Infection prevention and control, including appropriate use of PPE
- Variants of concern
- Proximity of crew to confirmed cases
- Duration of exposure to confirmed cases
- Size of the compartment in which the crew member and confirmed case interacted
- The number of confirmed cases of COVID-19 on board
- Potential breaches of PPE

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as primary close contacts.

Where it has been determined that a crew member is a primary close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix C: Risk assessment and identification of close contacts in aircrew.

Management of aircrew

Please see Appendix D: Guidance on the management of aircrew for information on management of aircrew including:

- Aircrew who test positive for SARS-CoV-2 in Australia;
- Aircrew who are a close contact of a person with confirmed COVID-19;
- Returning aircrew who are primary close contacts;
- Aircrew with historical infections; and
- Onward domestic travel of aircrew who are Australian residents.

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All international travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Organ donation and transplantation

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances where all alternative surge workforce strategies are exhausted and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (60). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Outbreak investigation and management

Appendix C: Risk assessment and identification of close contacts in aircrew

Appendix D: Guidance on the management of aircrew

Appendix E: Organ donation and transplantation

Appendix F: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
  - infection control measures being used in caring for the case, and
  - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all primary close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHU should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHU are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHU should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHU should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of primary close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be primary close contacts. These include, staff, residents (if relevant) and visitors.

PHU may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHU should ensure all primary close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHU may also require secondary close contacts or casual contacts to quarantine.

i. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

i. Assess and record vaccination status

During outbreak investigations, it is important PHU assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities.* While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.
Detailed information on environmental cleaning and disinfection in health and residential care settings is in the COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b. In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c. Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	Repeat Testing Days (where feasible)	Quarantine Cohort Day 1	Quarantine Cohort on Retest Day/s
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent

setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHU should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix C: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are primary close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew primary close contacts. For more information on contact tracing of aircraft passengers see Close Contacts and Special situations.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify primary close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a primary close contact:
    - Face-to-face contact of any duration with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as primary close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHU should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as primary close contacts.

Additional considerations for conducting a risk assessment should include:

1. Variants of concern
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

2. Proximity of crew to confirmed cases
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered primary close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. Duration of exposure to confirmed cases
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered primary close contacts.

4. Size of the compartment in which the crew and confirmed case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered primary close contacts.

5. The number of confirmed cases of COVID-19 on board
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. Potential breaches of PPE
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered primary close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered primary close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

Aircrew and passengers who are primary close contacts

If an airline becomes aware of a crew member or passenger who was a primary close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix D: Guidance on the management of aircrew.

Appendix D: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Air crew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (61-64).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (61).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to *the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals*.

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see *PHLN guidance on laboratory testing for SARS-CoV-2*).

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix F: Full revision history of the COVID-19 SoNG

Revision history			
Version	Date	Revised by	Changes
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.

3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.

2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.

1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.

1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

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Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 4.5
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Summary of revision history

For full revision history, please refer to Appendix F

Summary of revision history			
Version	Date	Revised by	Changes
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	04 March 2021	Communicable Diseases Network Australia	Inclusion of new section: Appendix C Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: The Disease; Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variants of concern.
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status. All newly confirmed cases should undergo whole genome sequencing.

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information, see Identification of potential source contacts.

Contact management

Close contacts should be managed according to management of contacts guidance.

Primary close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period, regardless of vaccination status. Primary close contacts should be actively monitored for development of fever or COVID-19 symptoms during this period, where feasible, and should be tested if symptoms develop. Primary close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

Routine testing is required for international travellers, international aircrew, COVID-19 quarantine and isolation facility workers and primary close contacts in quarantine.

For detailed guidance on laboratory testing for SARS-COV-2, please refer to *Public Health Laboratory Network Publications*.

2. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 80% sequence identity to SARS-CoV-1 (1, 2).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (3).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (4). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (4).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures), in the context of certain behaviours, such as singing and shouting (5) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (4). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (6, 7). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (8).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4 (9). R_0 for confined settings may be at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (10, 11).

Aerosol-generating procedures and particulate filter respirators

Appropriate care should be taken during aerosol-generating procedures. Airborne precautions, including the use of a particulate filter respirator (PFR), are required when performing aerosol-generating procedures on confirmed or suspected cases of COVID-19. Examples of aerosol-generating procedures include bronchoscopy, intubation, suctioning etc. in hospital settings. Listed examples of aerosol-generating procedures are available in the ICEG *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak*. Use of nebulisers should be avoided, where possible, and alternative administration devices (e.g. spacers) used for the administration of medication.

PFRs should also be considered in preference to a surgical mask in certain specified clinical settings. Staff who use PFRs should be trained in their correct use, including donning, doffing, and fit-checking at each use. For further information on the correct use of PFRs, see the ICEG guidance *The use of face masks and respirators in the context of COVID-19*.

The Testing section provides detailed information on appropriate PPE for sample collection for SARS-CoV-2.

SARS-CoV-2 variants of concern or interest

All viruses, including SARS-CoV-2, change over time. Most mutations won't significantly alter the behaviour of the virus. However occasionally, changes may provide either a biological advantage or disadvantage to virus propagation (12).

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (13, 14). Lineages for which there is no clear evidence that the mutations confer a change in the disease may be denoted 'variants under investigation' or 'variants of interest'. For more information please see: *PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

Some SARS-CoV-2 VOC have demonstrated the potential for escape from immune recognition. In vitro studies of some variants with the E484K mutation have shown evasion of neutralising antibodies in convalescent sera of individuals previously infected with non-variant SARS-CoV-2. Further studies are required to understand the impact of VOC on the risk of re-infection and vaccine effectiveness (15, 16).

The Communicable Diseases Genomics Network is actively monitoring variants and their reported mutations to understand how these may influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see *ICEG statement on infection prevention and control implications of highly transmissible SARSCoV-2 variants*.

Incubation period

The majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (17-19). Around 1% of COVID-19 cases will develop symptoms more than 14 days after exposure (20). The advice in this guideline uses an upper range of 14 days to guide public health measures such as quarantine and isolation. There is currently insufficient high-quality evidence to determine how the incubation period for emerging variants of concern may differ from other lineages.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (21, 22). Pre-symptomatic transmission can occur 1-3 days before symptom onset (23, 24). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (25).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (22). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (25). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (26).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the public health unit (PHU). Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (27-29). Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (1, 27-29). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (30).

The clinical presentation of COVID-19 differs from influenza, as the former typically presents with fever, then cough followed by myalgia, headache, and sore throat while the latter more commonly initiates with cough (31).

Recent studies have reported the clinical characteristics of patients with COVID-19. Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (32, 33). Older adults are at increased risk of severe disease compared with younger individuals due to age-related vulnerabilities (34, 35). While those with comorbid conditions have a higher incidence of severe or fatal outcomes, there are few studies investigating the relationship between severity and mortality of COVID-19 in the context of comorbidities (33).

COVID-19 is generally a mild disease in children, with the risk of severe disease being almost 25 times greater in adults (36, 37). A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (38).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (21, 22, 39-42).

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (43). Reported long-term symptoms, include fatigue, headache, attention disorder, mood changes, chest pain, palpitations, hair loss, and dyspnoea (43, 44). Fatigue is the most common long-term symptom affecting around 58% of individuals (43). For individuals who experience loss of smell and/or taste as a result of COVID-19, most regain these senses within the first 28 days following infection but up to a quarter experience longer-lasting dysfunction (45). Long-term symptoms following COVID-19 are more likely with increasing age, body mass index and female sex (46).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.1% (47). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems on patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is 3.1% (based on surveillance data notified in Australia as of 03 May 2021). Outbreaks in residential aged care facilities have contributed to Australia's slightly higher CFR compared with the global average due to the older age and higher rates of comorbid illness among those infected. To date, 75% (685/910) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data notified in Australia as of 03 May 2021).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (48).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (48). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (15, 48).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (15). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (15). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Vaccination

The SARS-CoV-2 vaccination program commenced in Australia on 22 February 2021. The Therapeutic Goods Administration has approved AstraZeneca ChAdOx1-S and Pfizer Australia - COMIRNATY BNT162b2 (mRNA) vaccines for distribution within Australia. Currently available evidence demonstrates that both AstraZeneca and Pfizer vaccines are effective in reducing the incidence and severity of COVID-19 (49).

It is not yet clear how widespread vaccination will affect the risk of SARS-CoV-2 transmission. Additionally, evidence is still emerging on vaccine effectiveness, including effectiveness following first and second doses (50).

The Australian Technical Advisory Group on Immunisation (ATAGI) has noted evidence of a rare but serious side effect involving thrombosis (clotting) with thrombocytopenia (low blood platelet count) following receipt of the AstraZeneca vaccine. ATAGI recommends the Pfizer vaccine as the preferred vaccine for adults aged under 50 years. For more information, see *ATAGI statement on AstraZeneca vaccine in response to new vaccine safety concerns*.

The safety and effectiveness of COVID-19 vaccination programs in Australia and overseas is being monitored closely in the context of how vaccination may impact upon the optimal public health management of COVID-19.

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or

working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas);
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

Disease occurrence and public health significance

Cases of COVID-19 were initially thought to be associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 10 May 2021, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 157.9 million confirmed cases and over 3.2 million deaths (47).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (51), and declared a pandemic on 12 March 2020 (52).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The *Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19)* details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the *Biosecurity (Listed Human Diseases) Determination 2016* as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the Australian Health Protection Principal Committee. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas

travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

3. Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. See *COVID-19 FAQs- international travellers to Australia*.

Jurisdictions will also conduct testing in COVID-19 quarantine and isolation facilities, for more information see Testing section.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practising effective hand hygiene and respiratory hygiene;
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants;
- Staying home and not attending public places including work or school if unwell;
- Maintaining a distance of 1.5 m from people when in public; and
- Wearing a face mask in situations where physical distancing cannot be maintained.

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

During outbreaks or in the presence of sustained community transmission, the use of masks in the community can supplement other control measures. See the ICEG guidance *Are cloth face masks likely to provide protection against COVID-19?*

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to 'stay at home' requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

4. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

5. Cases

Definitions

The rationale for the current case definitions is to ensure appropriate reporting, case management and public health follow up of people who could potentially transmit SARS-CoV-2.

Please refer to the Testing and Case Management sections for advice on who to test and recommended public health follow up actions for confirmed, historical or suspect cases.

Confirmed case

A confirmed case requires laboratory definitive evidence (where not classified as a historical case).

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

   OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

   OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Historical case

A historical case requires laboratory suggestive evidence AND either:

i. previous (prior to the past 14 days) clinical evidence OR

ii. previous (prior to the past 14 days) epidemiological evidence.

A historical case should not have symptoms of COVID-19 (or not have had symptoms of COVID-19 for the past 14 days).

Laboratory suggestive evidence:

1. Detection of SARS-CoV-2 by polymerase chain reaction (PCR) on two specimens at least 24 hours apart with results suggestive of a historical infection[3] on both specimens AND detection of IgG or total antibody, in the absence of vaccination[2,4];

   OR

2. Negative SARS-CoV-2 PCR AND detection of IgG or total antibody, in the absence of vaccination[2];

   OR

3. Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3] AND a subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence:

Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills) OR acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] OR loss of smell or loss of taste.

Epidemiological evidence:

- Close contact with a confirmed case (refer to Close contacts below)
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services
- International border staff
- Air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2.

For more information on the steps for determining a historical infection, please see Release from Isolation.

Suspect case

A person who meets the above clinical AND epidemiological criteria:

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and/or patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

Reporting

Confirmed cases should be notified in the jurisdiction of diagnosis and reported to the National Notifiable Diseases Surveillance System, except if previously diagnosed overseas or in another Australian jurisdiction.

Historical cases should be notified in the jurisdiction of diagnosis and reported to the National Notifiable Diseases Surveillance System, except if previously diagnosed overseas or in another Australian jurisdiction as a confirmed case.

People who have previously been diagnosed and managed overseas or in another Australian jurisdiction do not need to be notified as a confirmed or historical case. In this situation, the person should provide documented evidence of diagnosis overseas/interstate to the PHU.

Notes:

[1] There is possibility for false negative PCR results in children, as some children may be found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (53). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[3] PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

The Ct value of a reaction is the cycle number when the fluorescence of a PCR product is first detected above the background signal. The lower the Ct value, the more virus is present in the sample being tested, as fewer amplification cycles are required before the threshold for detection is met. A high Ct value generally indicates that it takes longer i.e. more cycles to detect the virus, indicating that there is less viral RNA present in the sample. Each PCR assay may have a different Ct value that is used for detecting SARS-CoV-2. Ct values for one in-vitro diagnostic (IVD) device should not be compared with Ct values from other platforms. This means there is no 'set' Ct value to aim for across all platforms. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, or results are ambiguous, interpretation of PCR results suggestive of a historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

To guide local approaches to testing, please refer to the *CDNA and PHLN Testing Framework for COVID-19 in Australia* (Testing Framework). The Testing Framework identifies key priority groups for targeted testing based on the likelihood of infection and the epidemiological situation. The Testing Framework also provides guidance on appropriate test types based on specific circumstances. Jurisdictions can apply this guidance according to their local context.

Infection prevention and control precautions

In the context of specimen collection for SARS-CoV-2 testing, the infection prevention and control precautions below represent the minimum national standard. Jurisdictions may undertake risk assessment to determine whether a higher level of PPE may be required, based on individual circumstances, including local epidemiology of COVID-19.

All jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures and guidance, see *ICEG-endorsed infection control guidance*.

Minimum infection prevention and control precautions for SARS-CoV-2 specimen collection:

- Perform hand hygiene
- Use gloves[1], gown, surgical mask and eye protection (safety glasses or face shield).
    - Gloves must be removed, and hand hygiene performed after each patient, and new gloves put on before the next one.
    - Safety glasses and face shields can be worn during consecutive patients' specimen collections in the same location.
        - If it is labelled as reusable, the face shield can be cleaned with a detergent/ disinfectant wipe in between uses by the same person.
    - If surgical masks are in short supply, they can be used for periods up to 4 hours during consecutive patients' specimen collections in the same location.
        - The mask should be discarded if it becomes wet or contaminated and on leaving the area.
        - Take care not to touch the mask while it is on; if the front of the mask is touched, remove and discard it, perform hand hygiene and put on a new one.
    - You can wear the same gown to collect specimens from more than one patient in the same location.
        - It must be changed if it becomes visibly contaminated.
        - It must be removed when leaving the immediate area to avoid contaminating other environments.

Note:

[1]Vinyl gloves are not recommended for the clinical care of residents in the context of COVID-19. Powder-free latex or nitrile gloves are accepted as superior in clinical care and are less likely to be breached compared with vinyl gloves. Gloves should be selected and worn in line with the *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019)*.

For information specific to SARS-CoV-2 variants of concern, see Infection prevention and control implications of highly transmissible SARS-CoV-2 variants.

Approach to specimen collection and testing for SARS-CoV-2

Laboratory testing for SARS-CoV-2 is important for individual patient diagnosis, and to guide infection prevention and control procedures and public health investigations. The main sample types submitted for testing are respiratory tract samples (upper and lower tract) and sera. Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) is the method of choice to detect SARS-CoV-2 during the acute illness.

Serology may be useful for diagnosis of historical COVID-19 cases, further investigation where nucleic acid testing is negative, and research purposes. However, currently no serological assays can reliably prove immunity to SARS-CoV-2 and the ability of serology to detect anti-spike antibody following vaccination for COVID-19 is unknown. The detection of anti-spike antibody cannot distinguish between natural infection and vaccination. Routine diagnostic serological testing is not recommended following COVID-19 vaccination.

Routine tests for acute pneumonia/pneumonitis should be requested where indicated and according to local protocols. This may include bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for other respiratory pathogens.

The occurrence of viral coinfection in SARS-CoV-2 has been negligible in Australia to date. However, if SARS-CoV-2 is not detected, testing for other common respiratory viruses in a person with an acute respiratory tract infection may be clinically appropriate.

For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; or the different types of SARS-CoV-2 specific testing, please refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Refer to *PHLN guidance on laboratory testing for SARS-CoV-2* and Genome sequencing for all cases for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, OR acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

All specimens should be collected in accordance with the appropriate guidelines, refer to *Coronavirus (COVID-19) guidance on use of personal protective equipment (PPE) in non-inpatient health care settings, during the COVID-19 outbreak.*

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions will conduct routine testing of international travellers who are in hotel quarantine. Testing should occur on day 0–2 and then on day 10-14, preferably as late as possible, of hotel quarantine, with results to be received prior to release from quarantine period. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – international travellers.

COVID-19 quarantine and isolation facility workers

All COVID-19 quarantine and isolation facility workers (e.g. health staff concierge, transport staff, police, security guards, cleaners etc.) are required to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHU should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Post testing instructions and isolation requirements for people with symptoms that may be due to COVID-19

Jurisdictions should give clear instructions on isolation requirements after COVID-19 testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

Individuals must follow all relevant post-testing instructions regardless of vaccination status.

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Factors to consider

Post-testing instructions and the level of isolation required after testing should consider the following factors:

- Epidemiological context
- Whether the person is symptomatic
- Potential risk of transmission of undiagnosed COVID-19
- The public health risk of creating a barrier to testing

Post-testing instructions and isolation requirements

PHUs may divide instructions on isolation requirements after testing into two groups:

1. People with a clinically compatible illness who are not in quarantine
2. People with a clinically compatible illness who are in quarantine

1. For people with a clinically compatible illness who are not in quarantine:
   - The person should stay at home until a negative test is returned AND symptoms have resolved[1].
   - Whilst staying at home and waiting for a negative test, they should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
   - Their household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions when <u>there is community transmission:</u>
   - Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
   - Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

2. For people with a clinically compatible illness who are in quarantine:
   - The person should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
   - They must remain in quarantine for the pre-determined period as determined by the relevant PHU, regardless of negative test result.

<u>Notes</u>:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a

setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is when there is a lack of an epidemiological risk factor for acquisition of COVID-19, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the PHUs first contact the laboratory microbiologist to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in close collaboration with the laboratory microbiologist and the treating clinician:

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.

2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA

3. Immediately collect another respiratory specimen for PCR testing, where feasible.

4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.

5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from primary close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed or suspect cases:

Begin follow up investigation of confirmed or suspect cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Case interviews, exposure site identification and primary close contact identification should be completed within 1 day of notification of a confirmed case.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Historical cases:

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined that the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information see Identification of potential source contacts.

Response procedure

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 (54, 55), whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case.
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Record vaccination status including vaccine type, date and country of administration.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing, aiming for identified primary close contacts to be placed in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities as transmission between humans and animals has been observed (56).

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- There is a reasonable level of confidence of the compliance of the case.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. See Release from isolation for further information.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection prevention and control precautions, pending further testing (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are primary close contacts or are required to quarantine for other purposes (e.g. international travel) must continue to quarantine for the remainder of the 14-day period, regardless of any negative test results. Refer to Management of contacts for further information.

In addition to standard precautions, including hand hygiene (5 Moments), the recommended minimum standard for the use of PPE during clinical care of people with confirmed or suspected COVID-19 are:

- Contact and droplet precautions for routine care of patients with confirmed or suspected COVID-19.

- Contact and airborne precautions when performing aerosol-generating procedures, and in other specified clinical circumstances. Refer to *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak* and *Recommended minimum requirements for the use of masks or respirators by health and residential care workers in areas with significant community transmission of COVID-19* for further information.

Jurisdictions may undertake risk assessment to determine whether a higher level of PPE may be required, based on individual circumstances, including local epidemiology of COVID-19. For detailed guidance on infection prevention and control precautions for clinical care of people with confirmed or suspected COVID-19, see the ICEG *Guidance on the minimum recommendations for the use of PPE in hospitals during the COVID-19 outbreak* and ICEG *Guidance on the use of PPE in non-inpatient health care settings, during the COVID-19 outbreak*.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another organism.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, a full respiratory panel for other pathogens should be done.

The following criteria can be used to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHU and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, interpretation of PCR results suggestive of a historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.
[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Confirmed cases known to be due to SARS-CoV-2 which is not a variant of concern and who do not meet historical infection criteria

The following information details the circumstances under which confirmed cases *not infected* with a SARS-CoV-2 variant of concern, as confirmed by whole genome sequencing, can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of the respiratory symptoms of the acute illness and fever for the previous 72 hours[1,2]

b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

The case can be released from isolation if they meet both of the following criteria [2]:

- at least 20 days have passed since the onset of symptoms; and
- the case is not significantly immunocompromised[4]

OR

The case can also be released from isolation if they meet all the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
- the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

In addition to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:

- PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture, serology results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and

human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of available evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (57-59). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a primary close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to all cases upon release from isolation.

Confirmed cases who do not meet the criteria for a historical infection and are infected with a SARS-CoV-2 variant of concern or unknown variant

The following information details the circumstances under which confirmed cases *infected with a SARS-CoV-2 variant of concern* as confirmed by whole genome sequencing, can be released from isolation.

These criteria also apply to confirmed cases who:

1. do not meet the criteria for release from isolation as a historical infection; and
2. are infected with an unknown SARS-CoV-2 variant. This includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern.

All cases *must* fulfil the following criteria to be considered for release from isolation:

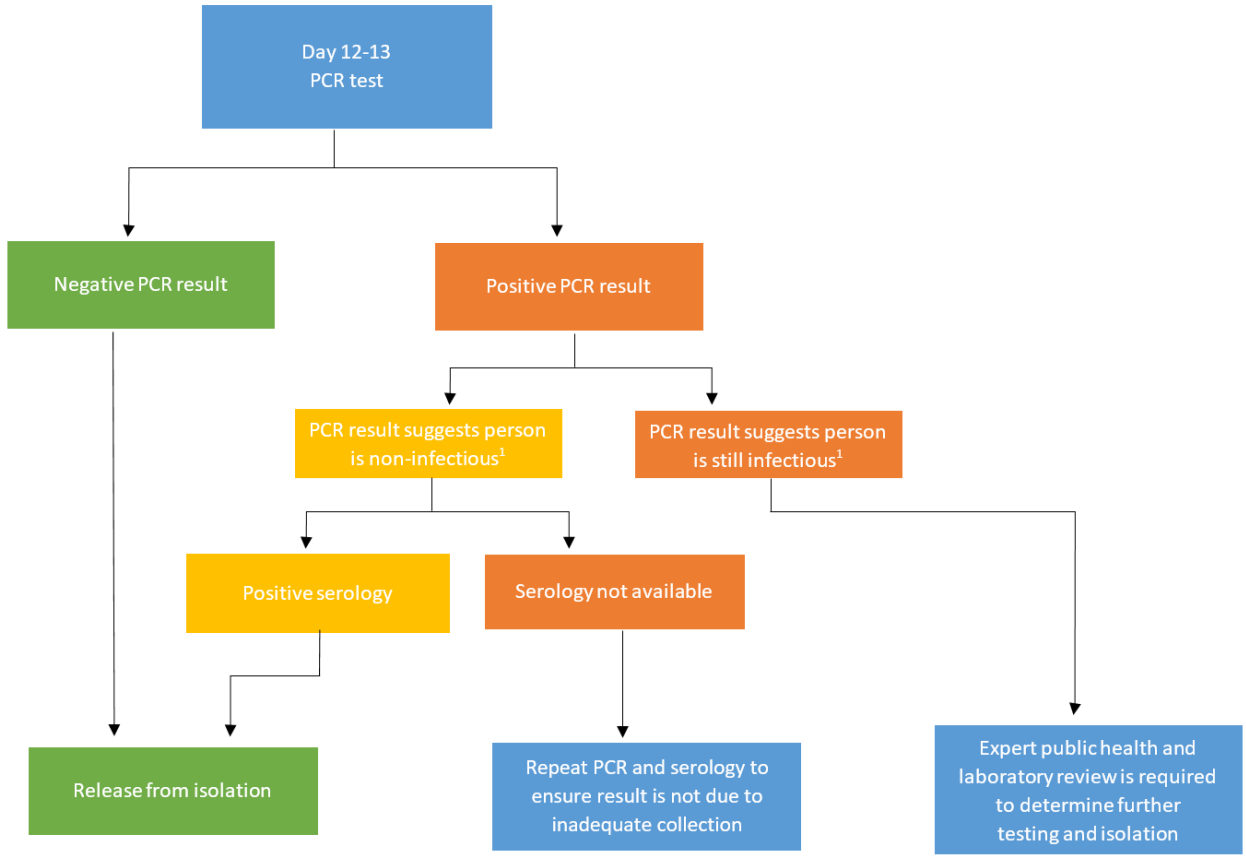
- at least 14 days have passed since the onset of symptoms or positive PCR if asymptomatic; and

- there has been clinical resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours.

In addition to the above criteria, cases must have a respiratory specimen for SARS-CoV-2 by PCR taken at day 12-13 from symptom onset (or from the first positive PCR date for asymptomatic cases). Cases should be managed as follows:

- If the day 12-13 PCR is negative, the case may be released from isolation, regardless of serology result; or
- If the day 12-13 PCR is positive but PCR results suggest they are non-infectious[1] AND spike or neutralising antibodies are also present, then the case can be released from isolation.
- If the day 12-13 PCR is positive but PCR results suggest they are non-infectious[1], and serology is not available or is negative, a repeat PCR could be performed (to ensure the result was not due to inadequate collection) and serology could be repeated, if available.
- If the day 12-13 PCR is positive and PCR results suggest they are still infectious[1], regardless of any serology result, expert public health and laboratory review is required to determine further testing and isolation.

Figure 1: Decision tree for COVID-19 cases infected with a variant of concern/unknown



Note:

[1] Interpretation of PCR results with regard to a case's potential stage of infection may include consideration of cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, interpretation of PCR results should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

6. Contacts

Close contact definitions

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. In a setting of limited or no community transmission, the following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

A primary close contact is anyone who has had unprotected exposure to a confirmed case. Identifying people who are secondary close contacts of those primary contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Identification of secondary contacts may be more applicable in household settings; situations where there are communication challenges with contacts; where the primary close contact may already be infected; settings where there may be delays in receiving testing results (e.g. remote settings); or where secondary contacts work in settings where there is a high transmission risk (e.g. residential aged care).

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious (refer to Release from isolation).
- the exposure may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)
- been exposed to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for returned travelers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts

Contact needs to have occurred within the infectious period of the case: a period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings, at the discretion of the PHU.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not generally considered to be primary

close contacts, provided that appropriate PPE has been worn and there has not been any breaches.

- For aircraft passengers, passengers who were seated in the same row or two rows in front or behind a confirmed case are considered primary close contacts in most instances. Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport. If the confirmed case was infected with a SARS-CoV-2 variant of concern, PHUs may consider classifying all passengers on board the flight as primary close contacts. Similar criteria can be used for people who have had close contact on bus or train trips.
- For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify which crew members should be considered primary close contacts. Refer to Special situations and Appendix C for further information.
- For more information about close contacts in different settings, refer to Special situations and Appendix C.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact

At the discretion of the PHU, some casual contacts may be classified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to people who do not meet the primary close contact definition (e.g. in restaurants, pubs, places of worship). The following factors should be considered prior to classifying casual contacts as primary close contacts:

- Epidemiological context, risk tolerance and level of community transmission
- Potential for the venue or setting to result in large scale amplification
- Jurisdictional capacity and resourcing requirements, including potential opportunity costs
- Adequate translation services, culturally-appropriate resources and engagement with community leaders, where appropriate

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact in any setting with a primary close contact from 24 hours after the primary contact's exposure to the case
- the exposure to the primary close contact may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

Primary close contacts:

- are required to quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- should be advised to monitor their health. PHUs should conduct active daily monitoring of primary close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case, during the case's infectious period.
- should be advised on the processes for seeking medical care, including on how to safely seek testing for COVID-19. Refer to Medical care for quarantined individuals.
- should be tested during the quarantine period. At a minimum this should occur
  - On entry to quarantine – a positive test result would make the primary close contact a case and support a decision to move the person to an alternative place for isolation and would also bring forward contact tracing for that person
  - If symptoms of COVID-19 develop
  - Before exit from quarantine (where appropriate)
    - For household and individually identified close contacts, and all other close contacts considered to be at higher risk of infection, finding a positive test result late in the quarantine period (e.g. day 10–12) of a primary close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community.
    - Exit screening is particularly important if the primary close contact is associated with a high risk setting or if the timing of potential exposure is likely to see infection develop later in the quarantine period.
    - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

Casual contacts

Casual contacts should be provided with information about their exposure and need to monitor for symptoms and seek testing if symptoms develop. Depending on the circumstances, they may be asked to attend for asymptomatic testing.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. exposed at a high-risk setting such as abattoir or hospital);
- The secondary contact has had extensive and/or ongoing exposure to the primary contact (e.g. living in the same household);
- There was a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary contact to become infectious prior to quarantine); or
- Secondary transmission has already occurred from a primary close contact to a secondary close contact.

Secondary close contacts should be quarantined until the PHU is certain that the primary close contact was not infectious at the time of last contact with the secondary close contact (i.e. the primary contact returns a negative test result, or the exposure time is not consistent with transmission) and contact with the primary contact is not ongoing.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may particularly be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix B: Outbreak investigation and management).

International travellers

International travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. For more information, see COVID-19 FAQs-international travellers to Australia.
All international travellers, with the exception of travellers from New Zealand in some jurisdictions, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. International travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined international travellers should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals. All international travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others (if they are quarantining with other people) should they become unwell. This advice should be followed for 14 days after returning from overseas/interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10-14, preferably as late as possible, of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the international traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the international traveller should be isolated and managed as per the recommendations for confirmed cases.

All international travellers who have undertaken international travel in the last 14 days who are unwell with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Health and residential care workers

Health and residential care workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results.

Infection prevention and control units of health and residential care facilities may assist PHUs to identify and monitor health and residential care worker close contacts.

It is recognised that clinical work restrictions on primary close contacts who are health or residential care workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring health and residential care workers implement appropriate infection prevention and control precautions when in close contact with confirmed and suspect COVID-19 cases. For detailed guidance on infection prevention and control, please refer to Infection Control Expert Group-endorsed infection prevention and control guidance.

In settings where the loss of the health and residential care worker will have a significant impact on health or residential care services, an individual risk assessment should be conducted in collaboration with the PHU.

Risk assessment of health and residential care workers

Where there are concerns regarding appropriate PPE use by the health or residential care worker and/or the case, a risk assessment should be performed to determine whether the contact was sufficient to warrant treatment as a primary close contact or a casual contact (with potential for testing and/or quarantine), see *Tables 2a* and *2b* below. Factors that may be considered include:

- Details of related transmission events in the outbreak.
- Vaccination status.
- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, singing, wandering).
- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed without appropriate PPE use.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Notes:

1. PHU should consider vaccination status as a component of risk assessment.
2. Exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Test and isolate until result received • Continue to work if negative • Health or residential care worker to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the health or residential care worker, and return of a negative result, prior to continuation of work.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who may be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19 case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as

soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

7. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control measures within the facility.

8. Special situations

Use of COVID-19 vaccination in outbreak situations

During COVID-19 outbreaks[1], targeted vaccination of identified, unvaccinated individuals at risk of exposure may supplement existing public health interventions. Examples of groups where targeted vaccination may occur include: individuals in closed populations, population groups with low vaccine coverage, or groups that are at higher risk of severe outcomes.

COVID-19 vaccination may be used for two purposes in the context of an outbreak:

1. As an outbreak management strategy to reduce the number and severity of COVID-19 cases associated with an outbreak, where there is likely to be an ongoing risk of exposure.
2. To opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

COVID-19 vaccination in outbreak management

There is no evidence to support the use of COVID-19 vaccination in first generation close contacts for the purpose of post-exposure prophylaxis. It takes around 14 days for a protective effect to be seen following the first dose of both the Pfizer and AstraZeneca vaccines (60). Vaccination as an outbreak response tool is likely to be of highest utility in closed settings and where there is an ongoing risk of exposure which may cause multiple chains of transmission, such as residential aged care facilities or correctional facilities. In this context, vaccination may be considered for unvaccinated individuals with the goals of:

- Direct protection against severe outcomes and death among those who receive vaccination.
- Limiting outbreak size and duration by reducing the risk of onward transmission, and thereby reducing morbidity/mortality/demand on clinical and public health resources.

Decision-making around the use of COVID-19 vaccines during outbreaks should consider the following key principles:

- The location, outbreak context, local epidemiology and likelihood of ongoing risk of exposure (beyond 14 days following vaccination) must be considered in the development of an outbreak vaccination strategy.
- The target population for vaccination should be clearly defined.
- Where there is constrained vaccine supply, priority should be given to those:
    - who have not yet received a first dose of vaccine.
    - at risk of severe outcomes or in whom non-pharmaceutical interventions are not possible (such as those unable to physically distance).
    - at highest risk of transmission of SARS-CoV-2.
- Evaluation should be undertaken after the conclusion of the outbreak.

Opportunistic vaccination

In geographic areas where an outbreak is occurring, opportunistic vaccination of eligible groups may be used to improve vaccination coverage in the population. An outbreak presents an opportunity to promote the benefits of COVID-19 vaccination to the broader community.

Note:

1. For the purposes of vaccination during outbreaks, an outbreak is defined as a single confirmed case of COVID-19 in the community. Individual jurisdictions' outbreak definitions may differ.

Aircrew

Testing and quarantine

Aircrew flying on international flights are required to be tested on arrival or undergo a COVID-19 test in Australia every 7 days, as directed by individual jurisdictions.

International aircrew arriving into Australia, who are not Australian-based (ie. local residents), need to quarantine in a dedicated quarantine facility either between international flights or for 14 days, whichever is the shortest. Aircrew who are local residents and who enter Australia in their state of residence may be allowed to quarantine at home for 14 days or until their next international flight. For more information, see *Australian Health Protection Principal Committee (AHPPC) statement on safe air travel – enhancing end-to-end mitigations – international*.

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew should be managed as primary close contacts.

Considerations for conducting a risk assessment should include:

- Infection prevention and control, including appropriate use of PPE
- Variants of concern
- Proximity of crew to confirmed cases
- Duration of exposure to confirmed cases
- Size of the compartment in which the crew member and confirmed case interacted
- The number of confirmed cases of COVID-19 on board
- Potential breaches of PPE

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as primary close contacts.

Where it has been determined that a crew member is a primary close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix C: Risk assessment and identification of close contacts in aircrew.

Management of aircrew

Please see Appendix D: Guidance on the management of aircrew for information on management of aircrew including:

- Aircrew who test positive for SARS-CoV-2 in Australia;
- Aircrew who are a close contact of a person with confirmed COVID-19;
- Returning aircrew who are primary close contacts;
- Aircrew with historical infections; and
- Onward domestic travel of aircrew who are Australian residents.

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All international travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Organ donation and transplantation

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances where all alternative surge workforce strategies are exhausted and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (61). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases). PHU may also consider vaccination status as a component of risk assessment.
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Outbreak investigation and management

Appendix C: Risk assessment and identification of close contacts in aircrew

Appendix D: Guidance on the management of aircrew

Appendix E: Organ donation and transplantation

Appendix F: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all primary close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.

- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.

- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHU should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHU are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHU should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHU should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of primary close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be primary close contacts. These include, staff, residents (if relevant) and visitors.

PHU may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHU should ensure all primary close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHU may also require secondary close contacts or casual contacts to quarantine.

i. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

i. Assess and record vaccination status

During outbreak investigations, it is important PHU assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities.* While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.
Detailed information on environmental cleaning and disinfection in health and residential care settings is in the COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b. In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c. Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	Repeat Testing Days (where feasible)	Quarantine Cohort Day 1	Quarantine Cohort on Retest Day/s
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent

setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHU should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix C: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are primary close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew primary close contacts. For more information on contact tracing of aircraft passengers see Close Contacts and Special situations.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify primary close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a primary close contact:
    - Face-to-face contact of any duration with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as primary close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHU should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as primary close contacts.

Additional considerations for conducting a risk assessment should include:

1. Variants of concern
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

2. Proximity of crew to confirmed cases
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered primary close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. Duration of exposure to confirmed cases
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered primary close contacts.

4. Size of the compartment in which the crew and confirmed case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered primary close contacts.

5. The number of confirmed cases of COVID-19 on board
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. Potential breaches of PPE
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered primary close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered primary close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

Aircrew and passengers who are primary close contacts

If an airline becomes aware of a crew member or passenger who was a primary close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix D: Guidance on the management of aircrew.

Appendix D: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Air crew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (62-65).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (62).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to *the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals*.

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see *PHLN guidance on laboratory testing for SARS-CoV-2*).

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix F: Full revision history of the COVID-19 SoNG

Revision history			
Version	Date	Revised by	Changes
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices

3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.

2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.

1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.

1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 4.6
16 June 2021

Summary of revision history

For full revision history, please refer to Appendix F

Summary of revision history			
Version	Date	Revised by	Changes
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	04 March 2021	Communicable Diseases Network Australia	Inclusion of new section: Appendix C Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: The Disease; Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variants of concern.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status. All newly confirmed cases should undergo whole genome sequencing.

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information, see Identification of potential source contacts.

Contact management

Close contacts should be managed according to management of contacts guidance.

Primary close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period, regardless of vaccination status. Primary close contacts should be actively monitored for development of fever or COVID-19 symptoms during this period, where feasible, and should be tested if symptoms develop. Primary close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

Routine testing is required for international travellers, international aircrew, COVID-19 quarantine and isolation facility workers and primary close contacts in quarantine.

For detailed guidance on laboratory testing for SARS-COV-2, please refer to *Public Health Laboratory Network Publications*.

2. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 80% sequence identity to SARS-CoV-1 (1, 2).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (3).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (4). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (4).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures), in the context of certain behaviours, such as singing and shouting (5) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (4). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (6, 7). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (8).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4 (9). R_0 for confined settings may be at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (10, 11).

SARS-CoV-2 variants of concern or interest

All viruses, including SARS-CoV-2, change over time. Most mutations won't significantly alter the behaviour of the virus. However occasionally, changes may provide either a biological advantage or disadvantage to virus propagation (12).

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (13, 14). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information please see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

Some SARS-CoV-2 VOC have demonstrated the potential for escape from immune recognition. In vitro studies of some variants with the E484K mutation have shown evasion of neutralising antibodies in convalescent sera of individuals previously infected with non-variant SARS-CoV-2. Further studies are required to understand the impact of VOC on the risk of re-infection and vaccine effectiveness (15, 16).

The Communicable Diseases Genomics Network is actively monitoring variants and their reported mutations to understand how these may influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see Infection Control Expert Group (ICEG) endorsed infection control guidance.

Incubation period

The majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (17-19). Around 1% of COVID-19 cases will develop symptoms more than 14 days after exposure (20). The advice in this guideline uses an upper range of 14 days to guide public health measures such as quarantine and isolation. There is currently insufficient high-quality evidence to determine how the incubation period for emerging variants of concern may differ from other lineages.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (21, 22). Pre-symptomatic transmission can occur 1-3 days before symptom onset (23, 24). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (25).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (22). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (25). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (26).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the public health unit (PHU). Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (27-29). Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (1, 27-29). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (30).

The clinical presentation of COVID-19 differs from influenza, as the former typically presents with fever, then cough followed by myalgia, headache, and sore throat while the latter more commonly initiates with cough (31).

Recent studies have reported the clinical characteristics of patients with COVID-19. Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (32, 33). Older adults are at increased risk of severe disease compared with younger individuals due to age-related vulnerabilities (34, 35). While those with comorbid conditions have a higher incidence of severe or fatal outcomes, there are few studies investigating the relationship between severity and mortality of COVID-19 in the context of comorbidities (33).

COVID-19 is generally a mild disease in children, with the risk of severe disease being almost 25 times greater in adults (36, 37). A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (38).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (21, 22, 39-42).

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (43). Reported long-term symptoms, include fatigue, headache, attention disorder, mood changes, chest pain, palpitations, hair loss, and dyspnoea (43, 44). Fatigue is the most common long-term symptom affecting around 58% of individuals (43). For individuals who experience loss of smell and/or taste as a result of COVID-19, most regain these senses within the first 28 days following infection but up to a quarter experience longer-lasting dysfunction (45). Long-term symptoms following COVID-19 are more likely with increasing age, body mass index and female sex (46).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.1% (47). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems on patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is 3.1% (based on surveillance data notified in Australia as of 03 May 2021). Outbreaks in residential aged care facilities have contributed to Australia's slightly higher CFR compared with the global average due to the older age and higher rates of comorbid illness among those infected. To date, 75% (685/910) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data notified in Australia as of 03 May 2021).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (48).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (48). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (15, 48).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (15). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (15). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Vaccination

The SARS-CoV-2 vaccination program commenced in Australia on 22 February 2021. The Therapeutic Goods Administration has approved AstraZeneca ChAdOx1-S and Pfizer Australia - COMIRNATY BNT162b2 (mRNA) vaccines for distribution within Australia. Currently available evidence demonstrates that both AstraZeneca and Pfizer vaccines are effective in reducing the incidence and severity of COVID-19 (49).

It is not yet clear how widespread vaccination will affect the risk of SARS-CoV-2 transmission. Additionally, evidence is still emerging on vaccine effectiveness, including effectiveness following first and second doses (50).

The Australian Technical Advisory Group on Immunisation (ATAGI) has noted evidence of a rare but serious side effect involving thrombosis (clotting) with thrombocytopenia (low blood platelet count) following receipt of the AstraZeneca vaccine. ATAGI recommends the Pfizer vaccine as the preferred vaccine for adults aged under 50 years. For more information, see *ATAGI statement on AstraZeneca vaccine in response to new vaccine safety concerns*.

The safety and effectiveness of COVID-19 vaccination programs in Australia and overseas is being monitored closely in the context of how vaccination may impact upon the optimal public health management of COVID-19.

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas);
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

Disease occurrence and public health significance

Cases of COVID-19 were initially thought to be associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 10 May 2021, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 157.9 million confirmed cases and over 3.2 million deaths (47).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (51), and declared a pandemic on 12 March 2020 (52).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The *Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19)* details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the *Biosecurity (Listed Human Diseases) Determination 2016* as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the Australian Health Protection Principal Committee. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

3. Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. See *COVID-19 FAQs- international travellers to Australia*.

Jurisdictions will also conduct testing in COVID-19 quarantine and isolation facilities, for more information see Testing section.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practising effective hand hygiene and respiratory hygiene;
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants;
- Staying home and not attending public places including work or school if unwell;
- Maintaining a distance of 1.5 m from people when in public; and
- Wearing a face mask in situations where physical distancing cannot be maintained.

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

During outbreaks or in the presence of sustained community transmission, the use of masks in the community can supplement other control measures.

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to 'stay at home' requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

4. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

5. Cases

Definitions

The rationale for the current case definitions is to ensure appropriate reporting, case management and public health follow up of people who could potentially transmit SARS-CoV-2.

Please refer to the Testing and Case Management sections for advice on who to test and recommended public health follow up actions for confirmed, historical or suspect cases.

Confirmed case

A confirmed case requires laboratory definitive evidence (where not classified as a historical case).

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

   OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

   OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Historical case

A historical case requires laboratory suggestive evidence AND either:

i. previous (prior to the past 14 days) clinical evidence OR

ii. previous (prior to the past 14 days) epidemiological evidence.

A historical case should not have symptoms of COVID-19 (or not have had symptoms of COVID-19 for the past 14 days).

Laboratory suggestive evidence:

1. Detection of SARS-CoV-2 by polymerase chain reaction (PCR) on two specimens at least 24 hours apart with results suggestive of a historical infection[3] on both specimens AND detection of IgG or total antibody, in the absence of vaccination[2,4];

   OR

2. Negative SARS-CoV-2 PCR AND detection of IgG or total antibody, in the absence of vaccination[2];

   OR

3. Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3] AND a subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence:

Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills) OR acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] OR loss of smell or loss of taste.

Epidemiological evidence:

- Close contact with a confirmed case (refer to Close contacts below)
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services
- International border staff
- Air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2.

For more information on the steps for determining a historical infection, please see Release from Isolation.

Suspect case

A person who meets the above clinical AND epidemiological criteria:

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and/or patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

Reporting

Confirmed cases should be notified in the jurisdiction of diagnosis and reported to the National Notifiable Diseases Surveillance System, except if previously diagnosed overseas or in another Australian jurisdiction.

Historical cases should be notified in the jurisdiction of diagnosis and reported to the National Notifiable Diseases Surveillance System, except if previously diagnosed overseas or in another Australian jurisdiction as a confirmed case.

People who have previously been diagnosed and managed overseas or in another Australian jurisdiction do not need to be notified as a confirmed or historical case. In this situation, the person should provide documented evidence of diagnosis overseas/interstate to the PHU.

Notes:

[1] There is possibility for false negative PCR results in children, as some children may be found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (53). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[3] PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

The Ct value of a reaction is the cycle number when the fluorescence of a PCR product is first detected above the background signal. The lower the Ct value, the more virus is present in the sample being tested, as fewer amplification cycles are required before the threshold for detection is met. A high Ct value generally indicates that it takes longer i.e. more cycles to detect the virus, indicating that there is less viral RNA present in the sample. Each PCR assay may have a different Ct value that is used for detecting SARS-CoV-2. Ct values for one in-vitro diagnostic (IVD) device should not be compared with Ct values from other platforms. This means there is no 'set' Ct value to aim for across all platforms. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, or results are ambiguous, interpretation of PCR results suggestive of a historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

To guide local approaches to testing, please refer to the *CDNA and PHLN Testing Framework for COVID-19 in Australia* (Testing Framework). The Testing Framework identifies key priority groups for targeted testing based on the likelihood of infection and the epidemiological situation. The Testing Framework also provides guidance on appropriate test types based on specific circumstances. Jurisdictions can apply this guidance according to their local context.

All jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures and guidance, see ICEG-endorsed infection control guidance.

Approach to specimen collection and testing for SARS-CoV-2

Laboratory testing for SARS-CoV-2 is important for individual patient diagnosis, and to guide infection prevention and control procedures and public health investigations. The main sample types submitted for testing are respiratory tract samples (upper and lower tract) and sera. Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) is the method of choice to detect SARS-CoV-2 during the acute illness.

Serology may be useful for diagnosis of historical COVID-19 cases, further investigation where nucleic acid testing is negative, and research purposes. However, currently no serological assays can reliably prove immunity to SARS-CoV-2 and the ability of serology to

detect anti-spike antibody following vaccination for COVID-19 is unknown. The detection of anti-spike antibody cannot distinguish between natural infection and vaccination. Routine diagnostic serological testing is not recommended following COVID-19 vaccination.

Routine tests for acute pneumonia/pneumonitis should be requested where indicated and according to local protocols. This may include bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for other respiratory pathogens.

The occurrence of viral coinfection in SARS-CoV-2 has been negligible in Australia to date. However, if SARS-CoV-2 is not detected, testing for other common respiratory viruses in a person with an acute respiratory tract infection may be clinically appropriate.

For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; or the different types of SARS-CoV-2 specific testing, please refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Refer to *PHLN guidance on laboratory testing for SARS-CoV-2* and Genome sequencing for all cases for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, OR acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions will conduct routine testing of international travellers who are in hotel quarantine. Testing should occur on day 0–2 and then on day 10-14, preferably as late as possible, of hotel quarantine, with results to be received prior to release from quarantine period. Exact arrangements will depend on state and territory protocols. Jurisdictions may

also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – international travellers.

COVID-19 quarantine and isolation facility workers

All COVID-19 quarantine and isolation facility workers (e.g. health staff concierge, transport staff, police, security guards, cleaners etc.) are required to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHU should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Post testing instructions and isolation requirements for people with symptoms that may be due to COVID-19

Jurisdictions should give clear instructions on isolation requirements after COVID-19 testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

Individuals must follow all relevant post-testing instructions regardless of vaccination status.

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Factors to consider

Post-testing instructions and the level of isolation required after testing should consider the following factors:

- Epidemiological context
- Whether the person is symptomatic
- Potential risk of transmission of undiagnosed COVID-19
- The public health risk of creating a barrier to testing

Post-testing instructions and isolation requirements

PHUs may divide instructions on isolation requirements after testing into two groups:

1. People with a clinically compatible illness who are not in quarantine
2. People with a clinically compatible illness who are in quarantine

1. For people with a clinically compatible illness who are not in quarantine:
   - The person should stay at home until a negative test is returned AND symptoms have resolved[1].
   - Whilst staying at home and waiting for a negative test, they should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
   - Their household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions when <u>there is community transmission:</u>
   - Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
   - Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

2. For people with a clinically compatible illness who are in quarantine:
   - The person should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
   - They must remain in quarantine for the pre-determined period as determined by the relevant PHU, regardless of negative test result.

<u>Notes</u>:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a

setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is when there is a lack of an epidemiological risk factor for acquisition of COVID-19, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the PHUs first contact the laboratory microbiologist to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in close collaboration with the laboratory microbiologist and the treating clinician:

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.

2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA

3. Immediately collect another respiratory specimen for PCR testing, where feasible.

4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.

5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from primary close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify 'potential source contacts'.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed or suspect cases:

Begin follow up investigation of confirmed or suspect cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Case interviews, exposure site identification and primary close contact identification should be completed within 1 day of notification of a confirmed case.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Historical cases:

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined that the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information see Identification of potential source contacts.

Response procedure

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 (54, 55), whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case.
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Record vaccination status including vaccine type, date and country of administration.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing, aiming for identified primary close contacts to be placed in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities as transmission between humans and animals has been observed (56).

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Personal protective equipment

For guidance on infection prevention and control, including personal protective equipment, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- If it can be assured that the home environment permits separation of the case from other household members, the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- There is a reasonable level of confidence of the compliance of the case.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. See Release from isolation for further information.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection prevention and control precautions, pending further testing (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are primary close contacts or are required to quarantine for other purposes (e.g. international travel) must continue to quarantine for the remainder of the 14-day period, regardless of any negative.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another organism.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, a full respiratory panel for other pathogens should be done.

The following criteria can be used to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHU and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, interpretation of PCR results suggestive of a historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Confirmed cases known to be due to SARS-CoV-2 which is not a variant of concern and who do not meet historical infection criteria

The following information details the circumstances under which confirmed cases *not infected* with a SARS-CoV-2 variant of concern, as confirmed by whole genome sequencing, can be released from isolation. Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2, or 3 – whichever is applicable. Significantly immunocompromised cases can be released from isolation if they meet the appropriate criteria in point 1, 2, or 3 and the additional criterion in point 4.

1. Confirmed cases who are asymptomatic.

   The case can be released from isolation if at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with mild illness (not requiring hospitalisation or admitted to hospital for reasons not directly related to acute COVID-19 e.g. infection control).

   The case can be released from isolation if they meet all of the following criteria:

   - at least 10 days have passed since the onset of symptoms; and
   - there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1,2]

3. Confirmed cases with more severe illness (where severity would warrant hospitalisation irrespective of whether the case was hospitalised or not).

   a. Confirmed cases with resolution of fever and respiratory symptoms of acute illness.

   The case can be released from isolation if they meet all of the following criteria:

   - at least 14 days have passed since onset of symptoms; and
   - there has been resolution of the respiratory symptoms of the acute illness and fever for the previous 72 hours[1,2]

   b. Confirmed cases without complete resolution of respiratory symptoms of acute illness.

   The case can be released from isolation if they meet both of the following criteria[2]:

   - at least 20 days have passed since the onset of symptoms; and
   - the case is not significantly immunocompromised[4]

   OR

   The case can also be released from isolation if they meet all the following criteria:

   - at least 14 days have passed since the onset of symptoms;
   - there has been resolution of fever for the previous 72 hours;
   - there has been substantial improvement in respiratory symptoms of the acute illness [1]; and

- the case has had two consecutive respiratory specimens negative[3] for SARS-CoV-2 by PCR taken at least 24 hours apart and at least 11 days from symptom onset.

4. Significantly immunocompromised persons.

   In addition to meeting the appropriate criteria described in points 1, 2, or 3a above, persons who are significantly immunocompromised[4] and are identified as confirmed cases must meet a higher standard requiring additional assessment. They can be released from isolation when they meet the following additional criterion:
   - PCR negative[3] on at least two consecutive respiratory specimens collected at least 24 hours apart at least 7 days after symptom onset[5].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] If a case who meets these criteria is additionally swabbed and tests positive, then the case can still be released from isolation based on current evidence from the literature and Australian public health experience that indicates these people are unlikely to be infectious.

[3] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture, serology results). This should be discussed with the treating medical practitioner, the testing laboratory and public health.

[4] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a bone marrow transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; and human immunodeficiency virus infection with CD4 T lymphocyte count below 200 cells/per mm3; or other conditions specifically noted by the treating medical practitioner.

[5] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness some time ago, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Based on a review of available evidence, persons who fulfil the appropriate criteria above are not considered to be infectious (57-59). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

The duration and degree of immunity following infection is not yet known. Persons who have been released from isolation should adhere to hygiene and physical distancing measures.

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a primary close contact of a confirmed case and the exposure was less than 8 weeks since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic). Recovered cases, unless immunocompromised, can continue to attend high-risk settings (refer to high-risk settings for examples of settings) and do not need to be furloughed from work if re-exposed during this 8 week period. For recovered cases exposed after 8 weeks from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

All recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated etc.) and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be retested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested, and remain persistently PCR positive in these samples after all the release from isolation criteria (above) are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised not to prepare food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to all cases upon release from isolation.

Confirmed cases who do not meet the criteria for a historical infection and are infected with a SARS-CoV-2 variant of concern or unknown variant

The following information details the circumstances under which confirmed cases *infected with a SARS-CoV-2 variant of concern* as confirmed by whole genome sequencing, can be released from isolation.

These criteria also apply to confirmed cases who:

1. do not meet the criteria for release from isolation as a historical infection; and
2. are infected with an unknown SARS-CoV-2 variant. This includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern.

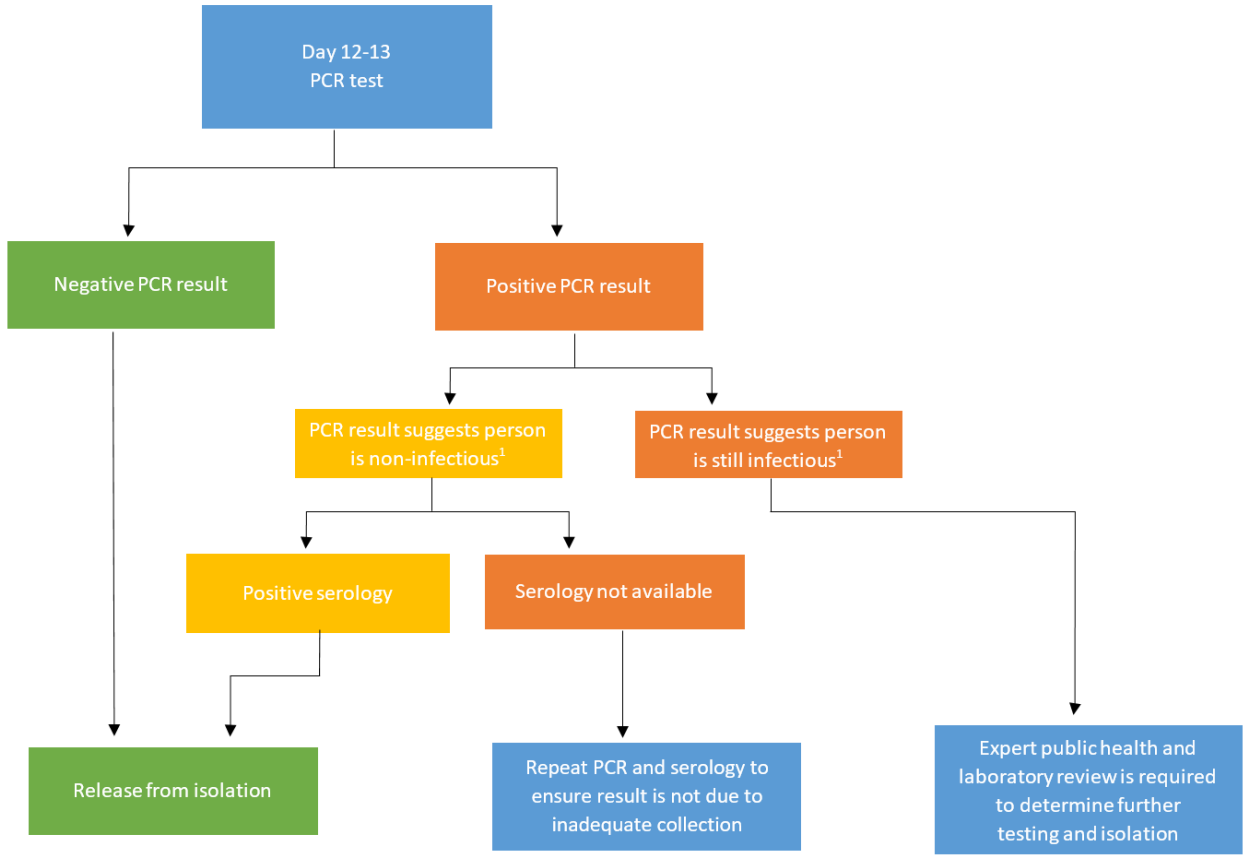
All cases *must* fulfil the following criteria to be considered for release from isolation:

- at least 14 days have passed since the onset of symptoms or positive PCR if asymptomatic; and
- there has been clinical resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours.

In addition to the above criteria, cases must have a respiratory specimen for SARS-CoV-2 by PCR taken at day 12-13 from symptom onset (or from the first positive PCR date for asymptomatic cases). Cases should be managed as follows:

- If the day 12-13 PCR is negative, the case may be released from isolation, regardless of serology result; or
- If the day 12-13 PCR is positive but PCR results suggest they are non-infectious[1] AND spike or neutralising antibodies are also present, then the case can be released from isolation.
- If the day 12-13 PCR is positive but PCR results suggest they are non-infectious[1], and serology is not available or is negative, a repeat PCR could be performed (to ensure the result was not due to inadequate collection) and serology could be repeated, if available.
- If the day 12-13 PCR is positive and PCR results suggest they are still infectious[1], regardless of any serology result, expert public health and laboratory review is required to determine further testing and isolation.

Figure 1: Decision tree for COVID-19 cases infected with a variant of concern/unknown



Note:

[1] Interpretation of PCR results with regard to a case's potential stage of infection may include consideration of cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist. Where a Ct value is not available, interpretation of PCR results should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

6. Contacts

Close contact definitions

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. In a setting of limited or no community transmission, the following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

A primary close contact is anyone who has had unprotected exposure to a confirmed case. Identifying people who are secondary close contacts of those primary contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Identification of secondary contacts may be more applicable in household settings; situations where there are communication challenges with contacts; where the primary close contact may already be infected; settings where there may be delays in receiving testing results (e.g. remote settings); or where secondary contacts work in settings where there is a high transmission risk (e.g. residential aged care).

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious (refer to Release from isolation).
- the exposure may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)
- been exposed to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for returned travelers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts

Contact needs to have occurred within the infectious period of the case: a period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings, at the discretion of the PHU.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not generally considered to be primary

close contacts, provided that appropriate PPE has been worn and there has not been any breaches.

- For aircraft passengers, passengers who were seated in the same row or two rows in front or behind a confirmed case are considered primary close contacts in most instances. Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport. If the confirmed case was infected with a SARS-CoV-2 variant of concern, PHUs may consider classifying all passengers on board the flight as primary close contacts. Similar criteria can be used for people who have had close contact on bus or train trips.
- For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify which crew members should be considered primary close contacts. Refer to Special situations and Appendix C for further information.
- For more information about close contacts in different settings, refer to Special situations and Appendix C.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact

At the discretion of the PHU, some casual contacts may be classified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to people who do not meet the primary close contact definition (e.g. in restaurants, pubs, places of worship). The following factors should be considered prior to classifying casual contacts as primary close contacts:

- Epidemiological context, risk tolerance and level of community transmission
- Potential for the venue or setting to result in large scale amplification
- Jurisdictional capacity and resourcing requirements, including potential opportunity costs
- Adequate translation services, culturally-appropriate resources and engagement with community leaders, where appropriate

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact in any setting with a primary close contact from 24 hours after the primary contact's exposure to the case
- the exposure to the primary close contact may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

Primary close contacts:

- are required to quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- should be advised to monitor their health. PHUs should conduct active daily monitoring of primary close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case, during the case's infectious period.
- should be advised on the processes for seeking medical care, including on how to safely seek testing for COVID-19. Refer to Medical care for quarantined individuals.
- should be tested during the quarantine period. At a minimum this should occur
  - On entry to quarantine – a positive test result would make the primary close contact a case and support a decision to move the person to an alternative place for isolation and would also bring forward contact tracing for that person
  - If symptoms of COVID-19 develop
  - Before exit from quarantine (where appropriate)
    - For household and individually identified close contacts, and all other close contacts considered to be at higher risk of infection, finding a positive test result late in the quarantine period (e.g. day 10–12) of a primary close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community.
    - Exit screening is particularly important if the primary close contact is associated with a high risk setting or if the timing of potential exposure is likely to see infection develop later in the quarantine period.
    - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

Casual contacts

Casual contacts should be provided with information about their exposure and need to monitor for symptoms and seek testing if symptoms develop. Depending on the circumstances, they may be asked to attend for asymptomatic testing.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to

quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. exposed at a high-risk setting such as abattoir or hospital);
- The secondary contact has had extensive and/or ongoing exposure to the primary contact (e.g. living in the same household);
- There was a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary contact to become infectious prior to quarantine); or
- Secondary transmission has already occurred from a primary close contact to a secondary close contact.

Secondary close contacts should be quarantined until the PHU is certain that the primary close contact was not infectious at the time of last contact with the secondary close contact (i.e. the primary contact returns a negative test result, or the exposure time is not consistent with transmission) and contact with the primary contact is not ongoing.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may particularly be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix B: Outbreak investigation and management).

International travellers

International travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. For more information, see COVID-19 FAQs-international travellers to Australia.

All international travellers, with the exception of travellers from New Zealand in some jurisdictions, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia. International travellers must adhere to jurisdictional quarantine requirements, which includes mandatory hotel quarantine.

In addition, some state and territory governments have travel restrictions for persons arriving from other domestic jurisdictions. Persons may be required to quarantine for 14 days following travel to another state or territory and should check local requirements before travelling.

Quarantined international travellers should be advised on the processes for seeking medical care. Refer to Medical care for quarantined individuals. All international travellers undertaking quarantine should self-monitor for symptoms and immediately isolate themselves from others (if they are quarantining with other people) should they become unwell. This advice should be followed for 14 days after returning from overseas/interstate.

Jurisdictions will test asymptomatic persons who are quarantined due to being a returned international traveller. They will do this on day 0–2 and then on day 10-14, preferably as late as possible, of hotel quarantine. Exact arrangements will depend on states and territories, with results from the second test to be received by the end of the quarantine period. Some jurisdictions may also test persons quarantined due to interstate travel.

If a negative test result is received, the international traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the international traveller should be isolated and managed as per the recommendations for confirmed cases.

All international travellers who have undertaken international travel in the last 14 days who are unwell with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Health and residential care workers

Health and residential care workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results.

Infection prevention and control units of health and residential care facilities may assist PHUs to identify and monitor health and residential care worker close contacts.

It is recognised that clinical work restrictions on primary close contacts who are health or residential care workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring health and residential care workers implement appropriate infection prevention and control precautions when in close contact with confirmed and suspect COVID-19 cases. For detailed guidance on infection prevention and control, please refer to Infection Control Expert Group-endorsed infection prevention and control guidance.

In settings where the loss of the health and residential care worker will have a significant impact on health or residential care services, an individual risk assessment should be conducted in collaboration with the PHU.

Risk assessment of health and residential care workers

Where there are concerns regarding appropriate PPE use by the health or residential care worker and/or the case, a risk assessment should be performed to determine whether the contact was sufficient to warrant treatment as a primary close contact or a casual contact

(with potential for testing and/or quarantine), see *Tables 2a* and *2b* below. Factors that may be considered include:

- Details of related transmission events in the outbreak.
- Vaccination status.
- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, singing, wandering).
- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed without appropriate PPE use.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Notes:

1. PHU should consider vaccination status as a component of risk assessment.
2. Exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Test and isolate until result received • Continue to work if negative • Health or residential care worker to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the health or residential care worker, and return of a negative result, prior to continuation of work.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who may be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19 case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

7. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control measures within the facility.

8. Special situations

Use of COVID-19 vaccination in outbreak situations

During COVID-19 outbreaks[1], targeted vaccination of identified, unvaccinated individuals at risk of exposure may supplement existing public health interventions. Examples of groups where targeted vaccination may occur include: individuals in closed populations, population groups with low vaccine coverage, or groups that are at higher risk of severe outcomes.

COVID-19 vaccination may be used for two purposes in the context of an outbreak:

1. As an outbreak management strategy to reduce the number and severity of COVID-19 cases associated with an outbreak, where there is likely to be an ongoing risk of exposure.
2. To opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

COVID-19 vaccination in outbreak management

There is no evidence to support the use of COVID-19 vaccination in first generation close contacts for the purpose of post-exposure prophylaxis. It takes around 14 days for a protective effect to be seen following the first dose of both the Pfizer and AstraZeneca vaccines (60). Vaccination as an outbreak response tool is likely to be of highest utility in closed settings and where there is an ongoing risk of exposure which may cause multiple chains of transmission, such as residential aged care facilities or correctional facilities. In this context, vaccination may be considered for unvaccinated individuals with the goals of:

- Direct protection against severe outcomes and death among those who receive vaccination.
- Limiting outbreak size and duration by reducing the risk of onward transmission, and thereby reducing morbidity/mortality/demand on clinical and public health resources.

Decision-making around the use of COVID-19 vaccines during outbreaks should consider the following key principles:

- The location, outbreak context, local epidemiology and likelihood of ongoing risk of exposure (beyond 14 days following vaccination) must be considered in the development of an outbreak vaccination strategy.
- The target population for vaccination should be clearly defined.
- Where there is constrained vaccine supply, priority should be given to those:
    - who have not yet received a first dose of vaccine.
    - at risk of severe outcomes or in whom non-pharmaceutical interventions are not possible (such as those unable to physically distance).
    - at highest risk of transmission of SARS-CoV-2.
- Evaluation should be undertaken after the conclusion of the outbreak.

Opportunistic vaccination

In geographic areas where an outbreak is occurring, opportunistic vaccination of eligible groups may be used to improve vaccination coverage in the population. An outbreak presents an opportunity to promote the benefits of COVID-19 vaccination to the broader community.

Note:

1. For the purposes of vaccination during outbreaks, an outbreak is defined as a single confirmed case of COVID-19 in the community. Individual jurisdictions' outbreak definitions may differ.

Aircrew

Testing and quarantine

Aircrew flying on international flights are required to be tested on arrival or undergo a COVID-19 test in Australia every 7 days, as directed by individual jurisdictions.

International aircrew arriving into Australia, who are not Australian-based (ie. local residents), need to quarantine in a dedicated quarantine facility either between international flights or for 14 days, whichever is the shortest. Aircrew who are local residents and who enter Australia in their state of residence may be allowed to quarantine at home for 14 days or until their next international flight. For more information, see *Australian Health Protection Principal Committee (AHPPC) statement on safe air travel – enhancing end-to-end mitigations – international*.

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew should be managed as primary close contacts.

Considerations for conducting a risk assessment should include:

- Infection prevention and control, including appropriate use of PPE
- Variants of concern
- Proximity of crew to confirmed cases
- Duration of exposure to confirmed cases
- Size of the compartment in which the crew member and confirmed case interacted
- The number of confirmed cases of COVID-19 on board
- Potential breaches of PPE

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as primary close contacts.

Where it has been determined that a crew member is a primary close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix C: Risk assessment and identification of close contacts in aircrew.

Management of aircrew

Please see Appendix D: Guidance on the management of aircrew for information on management of aircrew including:

- Aircrew who test positive for SARS-CoV-2 in Australia;
- Aircrew who are a close contact of a person with confirmed COVID-19;
- Returning aircrew who are primary close contacts;
- Aircrew with historical infections; and
- Onward domestic travel of aircrew who are Australian residents.

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All international travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Organ donation and transplantation

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances where all alternative surge workforce strategies are exhausted and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (61). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases). PHU may also consider vaccination status as a component of risk assessment.
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Outbreak investigation and management

Appendix C: Risk assessment and identification of close contacts in aircrew

Appendix D: Guidance on the management of aircrew

Appendix E: Organ donation and transplantation

Appendix F: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all primary close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.

- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.

- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHU should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHU are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHU should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHU should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of primary close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be primary close contacts. These include, staff, residents (if relevant) and visitors.

PHU may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHU should ensure all primary close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHU may also require secondary close contacts or casual contacts to quarantine.

i. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

i. Assess and record vaccination status

During outbreak investigations, it is important PHU assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities.* While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.
Detailed information on environmental cleaning and disinfection in health and residential care settings is in the COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b. In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c. Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	Repeat Testing Days (where feasible)	Quarantine Cohort Day 1	Quarantine Cohort on Retest Day/s
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent

setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHU should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix C: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are primary close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew primary close contacts. For more information on contact tracing of aircraft passengers see Close Contacts and Special situations.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify primary close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a primary close contact:
    - Face-to-face contact of any duration with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as primary close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHU should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as primary close contacts.

Additional considerations for conducting a risk assessment should include:

1. Variants of concern
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

2. Proximity of crew to confirmed cases
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered primary close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. Duration of exposure to confirmed cases
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered primary close contacts.

4. Size of the compartment in which the crew and confirmed case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered primary close contacts.

5. The number of confirmed cases of COVID-19 on board
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. Potential breaches of PPE
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered primary close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered primary close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

Aircrew and passengers who are primary close contacts

If an airline becomes aware of a crew member or passenger who was a primary close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix D: Guidance on the management of aircrew.

Appendix D: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Air crew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (62-65).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (62).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to *the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals*.

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see *PHLN guidance on laboratory testing for SARS-CoV-2*).

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix F: Full revision history of the COVID-19 SoNG

Revision history			
Version	Date	Revised by	Changes
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A

3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.

2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.

1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.

1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 4.7
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Summary of revision history

For full revision history, please refer to Appendix F

Summary of revision history			
Version	Date	Revised by	Changes
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	04 March 2021	Communicable Diseases Network Australia	Inclusion of new section: Appendix C Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: The Disease; Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variants of concern.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status. All newly confirmed cases should undergo whole genome sequencing.

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information, see Identification of potential source contacts.

Contact management

Close contacts should be managed according to management of contacts guidance.

Primary close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period, regardless of vaccination status. Primary close contacts should be actively monitored for development of fever or COVID-19 symptoms during this period, where feasible, and should be tested if symptoms develop. Primary close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

Routine testing is required for international travellers, international aircrew, COVID-19 quarantine and isolation facility workers and primary close contacts in quarantine.

For detailed guidance on laboratory testing for SARS-COV-2, please refer to *Public Health Laboratory Network Publications*.

2. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 80% sequence identity to SARS-CoV-1 (1, 2).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (3).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (4). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (4).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings (refer to Aerosol-generating procedures), in the context of certain behaviours, such as singing and shouting (5) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (4). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (6, 7). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (8).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4 (9). R_0 for confined settings may be at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (10, 11).

SARS-CoV-2 variants of concern or interest

All viruses, including SARS-CoV-2, change over time. Most mutations won't significantly alter the behaviour of the virus. However occasionally, changes may provide either a biological advantage or disadvantage to virus propagation (12).

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (13, 14). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information please see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

Some SARS-CoV-2 VOC have demonstrated the potential for escape from immune recognition. In vitro studies of some variants with the E484K mutation have shown evasion of neutralising antibodies in convalescent sera of individuals previously infected with non-variant SARS-CoV-2. Further studies are required to understand the impact of VOC on the risk of re-infection and vaccine effectiveness (15, 16).

The Communicable Diseases Genomics Network is actively monitoring variants and their reported mutations to understand how these may influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see Infection Control Expert Group (ICEG) endorsed infection control guidance.

Incubation period

The majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (17-19). Around 1% of COVID-19 cases will develop symptoms more than 14 days after exposure (20). The advice in this guideline uses an upper range of 14 days to guide public health measures such as quarantine and isolation. There is currently insufficient high-quality evidence to determine how the incubation period for emerging variants of concern may differ from other lineages.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (21, 22). Pre-symptomatic transmission can occur 1-3 days before symptom onset (23, 24). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (25).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (22). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (25). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (26).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the public health unit (PHU). Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (27-29). Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (1, 27-29). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (30).

The clinical presentation of COVID-19 differs from influenza, as the former typically presents with fever, then cough followed by myalgia, headache, and sore throat while the latter more commonly initiates with cough (31).

Recent studies have reported the clinical characteristics of patients with COVID-19. Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (32, 33). Older adults are at increased risk of severe disease compared with younger individuals due to age-related vulnerabilities (34, 35). While those with comorbid conditions have a higher incidence of severe or fatal outcomes, there are few studies investigating the relationship between severity and mortality of COVID-19 in the context of comorbidities (33).

COVID-19 is generally a mild disease in children, with the risk of severe disease being almost 25 times greater in adults (36, 37). A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (38).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (21, 22, 39-42).

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (43). Reported long-term symptoms, include fatigue, headache, attention disorder, mood changes, chest pain, palpitations, hair loss, and dyspnoea (43, 44). Fatigue is the most common long-term symptom affecting around 58% of individuals (43). For individuals who experience loss of smell and/or taste as a result of COVID-19, most regain these senses within the first 28 days following infection but up to a quarter experience longer-lasting dysfunction (45). Long-term symptoms following COVID-19 are more likely with increasing age, body mass index and female sex (46).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.1% (47). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems on patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is 3.1% (based on surveillance data notified in Australia as of 03 May 2021). Outbreaks in residential aged care facilities have contributed to Australia's slightly higher CFR compared with the global average due to the older age and higher rates of comorbid illness among those infected. To date, 75% (685/910) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data notified in Australia as of 03 May 2021).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (48).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (48). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (15, 48).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (15). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (15). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Vaccination

The SARS-CoV-2 vaccination program commenced in Australia on 22 February 2021. The Therapeutic Goods Administration has approved AstraZeneca ChAdOx1-S and Pfizer Australia - COMIRNATY BNT162b2 (mRNA) vaccines for distribution within Australia. Currently available evidence demonstrates that both AstraZeneca and Pfizer vaccines are effective in reducing the incidence and severity of COVID-19 (49).

It is not yet clear how widespread vaccination will affect the risk of SARS-CoV-2 transmission. Additionally, evidence is still emerging on vaccine effectiveness, including effectiveness following first and second doses (50).

The Australian Technical Advisory Group on Immunisation (ATAGI) has noted evidence of a rare but serious side effect involving thrombosis (clotting) with thrombocytopenia (low blood platelet count) following receipt of the AstraZeneca vaccine. ATAGI recommends the Pfizer vaccine as the preferred vaccine for adults aged under 50 years. For more information, see *ATAGI statement on AstraZeneca vaccine in response to new vaccine safety concerns*.

The safety and effectiveness of COVID-19 vaccination programs in Australia and overseas is being monitored closely in the context of how vaccination may impact upon the optimal public health management of COVID-19.

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas);
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

Disease occurrence and public health significance

Cases of COVID-19 were initially thought to be associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 10 May 2021, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 157.9 million confirmed cases and over 3.2 million deaths (47).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (51), and declared a pandemic on 12 March 2020 (52).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The *Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19)* details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the *Biosecurity (Listed Human Diseases) Determination 2016* as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the Australian Health Protection Principal Committee. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

3. Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. See *COVID-19 FAQs- international travellers to Australia*.

Jurisdictions will also conduct testing in COVID-19 quarantine and isolation facilities, for more information see Testing section.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practising effective hand hygiene and respiratory hygiene;
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants;
- Staying home and not attending public places including work or school if unwell;
- Maintaining a distance of 1.5 m from people when in public; and
- Wearing a face mask in situations where physical distancing cannot be maintained.

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

During outbreaks or in the presence of sustained community transmission, the use of masks in the community can supplement other control measures.

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.
- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to ‘stay at home’ requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

4. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

5. Cases

Definitions

Reporting

Both confirmed cases and historical cases should be notified in the jurisdiction of diagnosis.

People who meet the confirmed or historical case criteria who have previously been diagnosed and managed overseas or in another Australian jurisdiction do not need to be re-notified. In this situation, documented evidence of diagnosis overseas or interstate must be provided to the PHU.

Confirmed case

The confirmed case definition is intended to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

   OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

   OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Historical case

The historical case definition is intended to capture cases who have been infected sometime in the past that have not been previously reported and are not considered infectious at the time of diagnosis. Further laboratory testing is required to meet this criterion.

A historical case requires:

i. Laboratory evidence to support a historic infection; **AND**
ii. Absence of clinical evidence in the 14 days prior to swab date of positive test

Laboratory evidence of historic infection:

1. For people who have not been vaccinated:
   - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3]; **AND**
   - A subsequent PCR is negative OR suggestive of a historical infection[3], taken at least 24 hours apart; **AND**
   - Detection of IgG or total antibody[2];

   OR

2. For people who have been vaccinated:
   - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3]; **AND**
   - A subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence

- Fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] ; or
- Loss of smell or loss of taste.

Suspect case

The suspect case definition is intended to identify those who may have an increased likelihood of current SARS-CoV-2 infection. Suspect cases may require specific infection prevention and control measures and public health management. Suspect cases do not need to be notified to the NNDSS.

A suspect case is a person who meets the below **clinical** and **epidemiological** criteria.

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and/or patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

Clinical evidence (in the past 14 days):

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4]; or
- Loss of smell or loss of taste.

Epidemiological evidence (in the past 14 days):

- Close contact with a confirmed case (refer to Close contacts below)
- International travel, with the exception of green zone countries (e.g. New Zealand)
- Workers supporting designated COVID-19 quarantine and isolation services
- International border staff
- International air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2.

Notes:

[1] There is possibility for false negative PCR results in children, as some children may be found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (53). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[3] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

To guide local approaches to testing, please refer to the *CDNA and PHLN Testing Framework for COVID-19 in Australia* (Testing Framework). The Testing Framework identifies key priority groups for targeted testing based on the likelihood of infection and the epidemiological situation. The Testing Framework also provides guidance on appropriate test types based on specific circumstances. Jurisdictions can apply this guidance according to their local context.

All jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures and guidance, see ICEG-endorsed infection control guidance.

Approach to specimen collection and testing for SARS-CoV-2

Laboratory testing for SARS-CoV-2 is important for individual patient diagnosis, and to guide infection prevention and control procedures and public health investigations. The main sample types submitted for testing are respiratory tract samples (upper and lower tract) and sera. Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) is the method of choice to detect SARS-CoV-2 during the acute illness.

Serology may be useful for diagnosis of historical COVID-19 cases, further investigation where nucleic acid testing is negative, and research purposes. However, currently no serological assays can reliably prove immunity to SARS-CoV-2 and the ability of serology to detect anti-spike antibody following vaccination for COVID-19 is unknown. The detection of anti-spike antibody cannot distinguish between natural infection and vaccination. Routine diagnostic serological testing is not recommended following COVID-19 vaccination.

Routine tests for acute pneumonia/pneumonitis should be requested where indicated and according to local protocols. This may include bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for other respiratory pathogens.

The occurrence of viral coinfection in SARS-CoV-2 has been negligible in Australia to date. However, if SARS-CoV-2 is not detected, testing for other common respiratory viruses in a person with an acute respiratory tract infection may be clinically appropriate.

For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; or the different types of SARS-CoV-2 specific testing, please refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen

genomics capacity and capability at varying levels. Refer to *PHLN guidance on laboratory testing for SARS-CoV-2* and Genome sequencing for all cases for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Testing beyond the suspect case definition should be undertaken on persons with: fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills) or loss of smell or loss of taste, where no other clinical focus of infection or alternate explanation of the patient's illness is evident, OR acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Testing beyond the suspect case definition may, based on the clinical and public health judgement of the treating clinician, include individuals with sudden and unexplained onset of one or more of these other symptoms.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions will conduct routine testing of international travellers who are in hotel quarantine. Testing should occur on day 0–2 and then on day 10-14, preferably as late as possible, of hotel quarantine, with results to be received prior to release from quarantine period. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – international travellers.

COVID-19 quarantine and isolation facility workers

All COVID-19 quarantine and isolation facility workers (e.g. health staff concierge, transport staff, police, security guards, cleaners etc.) are required to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-

19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHU should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Post testing instructions and isolation requirements for people with symptoms that may be due to COVID-19

Jurisdictions should give clear instructions on isolation requirements after COVID-19 testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

Individuals must follow all relevant post-testing instructions regardless of vaccination status.

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Factors to consider

Post-testing instructions and the level of isolation required after testing should consider the following factors:

- Epidemiological context
- Whether the person is symptomatic
- Potential risk of transmission of undiagnosed COVID-19
- The public health risk of creating a barrier to testing

Post-testing instructions and isolation requirements

PHUs may divide instructions on isolation requirements after testing into two groups:

1. People with a clinically compatible illness who are not in quarantine
2. People with a clinically compatible illness who are in quarantine

1. For people with a clinically compatible illness who are not in quarantine:
   - The person should stay at home until a negative test is returned AND symptoms have resolved[1].
   - Whilst staying at home and waiting for a negative test, they should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
   - Their household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions when <u>there is community transmission:</u>

- Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.

- Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

2. For people with a clinically compatible illness who are in quarantine:
   - The person should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
   - They must remain in quarantine for the pre-determined period as determined by the relevant PHU, regardless of negative test result.

Notes:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when

determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is when there is a lack of an epidemiological risk factor for acquisition of COVID-19, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the PHUs first contact the laboratory microbiologist to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in close collaboration with the laboratory microbiologist and the treating clinician:

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from primary close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify ‘potential source contacts’.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed or suspect cases:

Begin follow up investigation of confirmed or suspect cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Case interviews, exposure site identification and primary close contact identification should be completed within 1 day of notification of a confirmed case.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Historical cases:

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined that the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information see Identification of potential source contacts.

Response procedure

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 (54, 55), whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases

Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case.
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Record vaccination status including vaccine type, date and country of administration.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing, aiming for identified primary close contacts to be placed in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities as transmission between humans and animals has been observed (56).

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Personal protective equipment

For guidance on infection prevention and control, including personal protective equipment, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital, at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- There is a reasonable level of confidence of the compliance of the case.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. See Release from isolation for further information.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection prevention and control precautions, pending further testing (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are primary close contacts or are required to quarantine for other purposes (e.g. international travel) must continue to quarantine for the remainder of the 14-day period, regardless of any negative.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another pathogen.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, testing for other respiratory pathogens should be performed.

The following criteria can be used to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHU and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine

whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms that do not report Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Release from isolation criteria for all confirmed cases who do not meet historical infection criteria

Note: Revisions to the release from isolation criteria have been made due to the significant increase in number of cases infected with SARS-CoV-2 variants of concern in Australia.

The following information details the circumstances under which all confirmed cases can be released from isolation. This includes confirmed cases infected with a SARS-CoV-2 variant of concern.

Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2, or 3 – whichever is applicable.

Significantly immunocompromised cases will also need to meet additional criterion in point 4 in order to be released from isolation.

Where all clinical criteria are met for points 1 or 2 below, some cases may be eligible for early release from isolation after day 10 from symptom onset if:

- PCR is negative; or
- detection of SARS-CoV-2 specific IgG or total antibodies on serology, in the absence of vaccination.

1. Confirmed cases who have remained asymptomatic

The case can be released from isolation if at least 14 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with resolution of fever and acute respiratory symptoms

The case can be released from isolation if they meet all of the following criteria:

- at least 14 days have passed since the onset of symptoms; and
- there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]

3. Confirmed cases without complete resolution of fever and acute respiratory symptoms

The case can be released from isolation if they meet **both** of the following criteria:

- at least 20 days have passed since the onset of symptoms; and

- the case is not significantly immunocompromised[3]

OR

The case can also be released from isolation if they meet **all** the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
- the case has had two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 10 from symptom onset.

4. Significantly immunocompromised persons

In addition to meeting the appropriate criteria described in points 1 or 2 above, persons who are significantly immunocompromised[3] and are identified as confirmed cases must meet a higher standard requiring additional assessment.

They can be released from isolation when they meet the following additional criterion:

- PCR negative[2] on at least two consecutive respiratory specimens collected at least 24 hours apart after day 7 from symptom onset[4].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). This should be discussed with the treating medical practitioner, the testing laboratory and public health unit.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Testing post-release from isolation

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case has not re-developed COVID-19 symptoms but is swabbed and tests positive after they have met the above release from isolation criteria, then the case does not require re-isolation. Current evidence and Australian public health experience indicates these people are unlikely to be infectious.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness consistent with a historic infection, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Release from isolation and high-risk settings

Based on a review of available evidence, persons who fulfil the appropriate criteria above are not considered to be infectious, including those infected with a variant of concern (57-61). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Release from isolation and re-exposure

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a primary close contact of a confirmed case and the re-exposure was less than 6 months since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic).

Recovered cases, unless immunocompromised, can continue to attend high-risk settings and do not need to be furloughed from work if re-exposed during this 6 month period.

For recovered cases re-exposed after 6 months from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist and/or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.)

and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be re-tested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Release from isolation and gastrointestinal symptoms

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested and remain persistently PCR positive in these samples after all release from isolation criteria are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised against preparing food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to all cases upon release from isolation.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

6. Contacts

Close contact definitions

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. In a setting of limited or no community transmission, the following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

A primary close contact is anyone who has had unprotected exposure to a confirmed case. Identifying people who are secondary close contacts of those primary contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Identification of secondary contacts may be more applicable in household settings; situations where there are communication challenges with contacts; where the primary close contact may already be infected; settings where there may be delays in receiving testing results (e.g. remote settings); or where secondary contacts work in settings where there is a high transmission risk (e.g. residential aged care).

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious (refer to Release from isolation).
- the exposure may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)
- been exposed to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for returned travelers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts

Contact needs to have occurred within the infectious period of the case: a period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings, at the discretion of the PHU.

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the asymptomatic (or pre-symptomatic) case's infectious period and to inform identification of contacts.

Note that:

- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not generally considered to be primary

close contacts, provided that appropriate PPE has been worn and there has not been any breaches.

- For aircraft passengers, passengers who were seated in the same row or two rows in front or behind a confirmed case are considered primary close contacts in most instances. Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport. If the confirmed case was infected with a SARS-CoV-2 variant of concern, PHUs may consider classifying all passengers on board the flight as primary close contacts. Similar criteria can be used for people who have had close contact on bus or train trips.
- For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify which crew members should be considered primary close contacts. Refer to Special situations and Appendix C for further information.
- For more information about close contacts in different settings, refer to Special situations and Appendix C.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact

At the discretion of the PHU, some casual contacts may be classified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to people who do not meet the primary close contact definition (e.g. in restaurants, pubs, places of worship). The following factors should be considered prior to classifying casual contacts as primary close contacts:

- Epidemiological context, risk tolerance and level of community transmission
- Potential for the venue or setting to result in large scale amplification
- Jurisdictional capacity and resourcing requirements, including potential opportunity costs
- Adequate translation services, culturally-appropriate resources and engagement with community leaders, where appropriate

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact in any setting with a primary close contact from 24 hours after the primary contact's exposure to the case
- the exposure to the primary close contact may be any duration depending on risk setting such as: transmission has already been proven to have readily occurred, there are concerns about adequate air exchange in an indoor environment or concerns about the nature of contact in the place of exposure (e.g. the contact has been exposed to shouting or singing)

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

Primary close contacts:

- are required to quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- should be advised to monitor their health. PHUs should conduct active daily monitoring of primary close contacts for symptoms for 14 days after the last possible contact with a confirmed COVID-19 case, during the case's infectious period.
- should be advised on the processes for seeking medical care, including on how to safely seek testing for COVID-19. Refer to Medical care for quarantined individuals.
- should be tested during the quarantine period. At a minimum this should occur
  - On entry to quarantine – a positive test result would make the primary close contact a case and support a decision to move the person to an alternative place for isolation and would also bring forward contact tracing for that person
  - If symptoms of COVID-19 develop
  - Before exit from quarantine (where appropriate)
    - For household and individually identified close contacts, and all other close contacts considered to be at higher risk of infection, finding a positive test result late in the quarantine period (e.g. day 10–12) of a primary close contact who is asymptomatic or has under-reported symptoms would prevent the release of potentially infectious people into the community.
    - Exit screening is particularly important if the primary close contact is associated with a high risk setting or if the timing of potential exposure is likely to see infection develop later in the quarantine period.
    - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

Casual contacts

Casual contacts should be provided with information about their exposure and need to monitor for symptoms and seek testing if symptoms develop. Depending on the circumstances, they may be asked to attend for asymptomatic testing.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to

quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. exposed at a high-risk setting such as abattoir or hospital);
- The secondary contact has had extensive and/or ongoing exposure to the primary contact (e.g. living in the same household);
- There was a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary contact to become infectious prior to quarantine); or
- Secondary transmission has already occurred from a primary close contact to a secondary close contact.

Secondary close contacts should be quarantined until the PHU is certain that the primary close contact was not infectious at the time of last contact with the secondary close contact (i.e. the primary contact returns a negative test result, or the exposure time is not consistent with transmission) and contact with the primary contact is not ongoing.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may particularly be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix B: Outbreak investigation and management).

International travellers

International travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

Jurisdictions will conduct routine testing of international travellers who are in hotel quarantine. At a minimum, testing should occur on day 0–2 and then on day 10-14, preferably as late as possible, of hotel quarantine, with results to be received prior to release

from quarantine. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel.

If negative test results are received, the international traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the international traveller should be isolated and managed as per the recommendations for confirmed cases.

All international travellers who have undertaken international travel in the last 14 days who are unwell with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

At a minimum, jurisdictions should provide messaging to all travellers who complete mandatory hotel quarantine to indicate that if they develop symptoms within 14 days of leaving quarantine they must get tested and isolate until they receive a negative result.

Health and residential care workers

Health and residential care workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results.

Infection prevention and control units of health and residential care facilities may assist PHUs to identify and monitor health and residential care worker close contacts.

It is recognised that clinical work restrictions on primary close contacts who are health or residential care workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring health and residential care workers implement appropriate infection prevention and control precautions when in close contact with confirmed and suspect COVID-19 cases. For detailed guidance on infection prevention and control, please refer to Infection Control Expert Group-endorsed infection prevention and control guidance.

In settings where the loss of the health and residential care worker will have a significant impact on health or residential care services, an individual risk assessment should be conducted in collaboration with the PHU.

Risk assessment of health and residential care workers

Where there are concerns regarding appropriate PPE use by the health or residential care worker and/or the case, a risk assessment should be performed to determine whether the contact was sufficient to warrant treatment as a primary close contact or a casual contact (with potential for testing and/or quarantine), see *Tables 2a* and *2b* below. Factors that may be considered include:

- Details of related transmission events in the outbreak.
- Vaccination status.
- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, singing, wandering).
- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed without appropriate PPE use.

- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	Close contact (refer to Close contact definition for further information)	Environmental contamination and/or working in COVID-19 treatment or testing facility	Casual contact (contact not meeting the Close contact definition)
Contact PPE	No PPE	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect doffing	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Notes:

1. PHU should consider vaccination status as a component of risk assessment.
2. Exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Test and isolate until result received • Continue to work if negative • Health or residential care worker to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the health or residential care worker, and return of a negative result, prior to continuation of work.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who may be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19 case definition, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as

soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

7. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for Managing the risk of COVID-19 exposure: meat and poultry processing. PHUs may also refer to the US Centers for Disease Control's Facility Assessment Tool for Meat and Poultry Processing Facilities to conduct an assessment of infection prevention and control measures within the facility.

8. Special situations

Use of COVID-19 vaccination in outbreak situations

During COVID-19 outbreaks[1], targeted vaccination of identified, unvaccinated individuals at risk of exposure may supplement existing public health interventions. Examples of groups where targeted vaccination may occur include: individuals in closed populations, population groups with low vaccine coverage, or groups that are at higher risk of severe outcomes.

COVID-19 vaccination may be used for two purposes in the context of an outbreak:

1. As an outbreak management strategy to reduce the number and severity of COVID-19 cases associated with an outbreak, where there is likely to be an ongoing risk of exposure.
2. To opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

COVID-19 vaccination in outbreak management

There is no evidence to support the use of COVID-19 vaccination in first generation close contacts for the purpose of post-exposure prophylaxis. It takes around 14 days for a protective effect to be seen following the first dose of both the Pfizer and AstraZeneca vaccines (62). Vaccination as an outbreak response tool is likely to be of highest utility in closed settings and where there is an ongoing risk of exposure which may cause multiple chains of transmission, such as residential aged care facilities or correctional facilities. In this context, vaccination may be considered for unvaccinated individuals with the goals of:

- Direct protection against severe outcomes and death among those who receive vaccination.
- Limiting outbreak size and duration by reducing the risk of onward transmission, and thereby reducing morbidity/mortality/demand on clinical and public health resources.

Decision-making around the use of COVID-19 vaccines during outbreaks should consider the following key principles:

- The location, outbreak context, local epidemiology and likelihood of ongoing risk of exposure (beyond 14 days following vaccination) must be considered in the development of an outbreak vaccination strategy.
- The target population for vaccination should be clearly defined.
- Where there is constrained vaccine supply, priority should be given to those:
    - who have not yet received a first dose of vaccine.
    - at risk of severe outcomes or in whom non-pharmaceutical interventions are not possible (such as those unable to physically distance).
    - at highest risk of transmission of SARS-CoV-2.
- Evaluation should be undertaken after the conclusion of the outbreak.

Opportunistic vaccination

In geographic areas where an outbreak is occurring, opportunistic vaccination of eligible groups may be used to improve vaccination coverage in the population. An outbreak presents an opportunity to promote the benefits of COVID-19 vaccination to the broader community.

Note:

1. For the purposes of vaccination during outbreaks, an outbreak is defined as a single confirmed case of COVID-19 in the community. Individual jurisdictions' outbreak definitions may differ.

Aircrew

Testing and quarantine

Aircrew flying on international flights are required to be tested on arrival or undergo a COVID-19 test in Australia every 7 days, as directed by individual jurisdictions.

International aircrew arriving into Australia, who are not Australian-based (ie. local residents), need to quarantine in a dedicated quarantine facility either between international flights or for 14 days, whichever is the shortest. Aircrew who are local residents and who enter Australia in their state of residence may be allowed to quarantine at home for 14 days or until their next international flight. For more information, see *Australian Health Protection Principal Committee (AHPPC) statement on safe air travel – enhancing end-to-end mitigations – international*.

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew should be managed as primary close contacts.

Considerations for conducting a risk assessment should include:

- Infection prevention and control, including appropriate use of PPE
- Variants of concern
- Proximity of crew to confirmed cases
- Duration of exposure to confirmed cases
- Size of the compartment in which the crew member and confirmed case interacted
- The number of confirmed cases of COVID-19 on board
- Potential breaches of PPE

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as primary close contacts.

Where it has been determined that a crew member is a primary close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix C: Risk assessment and identification of close contacts in aircrew.

Management of aircrew

Please see Appendix D: Guidance on the management of aircrew for information on management of aircrew including:

- Aircrew who test positive for SARS-CoV-2 in Australia;
- Aircrew who are a close contact of a person with confirmed COVID-19;
- Returning aircrew who are primary close contacts;
- Aircrew with historical infections; and
- Onward domestic travel of aircrew who are Australian residents.

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All international travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Organ donation and transplantation

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances where all alternative surge workforce strategies are exhausted and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (63). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases). PHU may also consider vaccination status as a component of risk assessment.
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Outbreak investigation and management

Appendix C: Risk assessment and identification of close contacts in aircrew

Appendix D: Guidance on the management of aircrew

Appendix E: Organ donation and transplantation

Appendix F: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case, and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all primary close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to Special risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Outbreak investigation and management

Definitions

Outbreak: For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.

Index case: An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.

Primary case: A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.

- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.

- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHU should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHU are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHU should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHU should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of primary close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be primary close contacts. These include, staff, residents (if relevant) and visitors.

PHU may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHU should ensure all primary close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHU may also require secondary close contacts or casual contacts to quarantine.

i. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

i. Assess and record vaccination status

During outbreak investigations, it is important PHU assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities.* While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.
Detailed information on environmental cleaning and disinfection in health and residential care settings is in the COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a. With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b. In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c. Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	Repeat Testing Days (where feasible)	Quarantine Cohort Day 1	Quarantine Cohort on Retest Day/s
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent

setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHU should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix C: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are primary close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew primary close contacts. For more information on contact tracing of aircraft passengers see Close Contacts and Special situations.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify primary close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a primary close contact:
    - Face-to-face contact of any duration with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as primary close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHU should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as primary close contacts.

Additional considerations for conducting a risk assessment should include:

1. Variants of concern
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

2. Proximity of crew to confirmed cases
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered primary close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. Duration of exposure to confirmed cases
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered primary close contacts.

4. Size of the compartment in which the crew and confirmed case interacted
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered primary close contacts.

5. The number of confirmed cases of COVID-19 on board
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. Potential breaches of PPE
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered primary close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered primary close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

Aircrew and passengers who are primary close contacts

If an airline becomes aware of a crew member or passenger who was a primary close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix D: Guidance on the management of aircrew.

Appendix D: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Air crew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (64-67).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (64).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to *the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals*.

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see *PHLN guidance on laboratory testing for SARS-CoV-2*).

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix F: Full revision history of the COVID-19 SoNG

Revision history			
Version	Date	Revised by	Changes
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C

3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.

2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.

2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.

1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	7 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	6 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	4 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	2 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 4.8

07 September 2021

Summary of revision history

For full revision history, please refer to Appendix F

Version	Date	Revised by	Changes
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	04 March 2021	Communicable Diseases Network Australia	Inclusion of new section: Appendix C Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation , Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: The Disease; Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variants of concern.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status. All newly confirmed cases should undergo whole genome sequencing.

Confirmed cases who are hospitalised should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of patients with confirmed or suspected COVID-19, including personal protective equipment, see ICEG-endorsed infection control guidance.

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information, see Identification of potential source contacts.

Contact management

Close contacts should be managed according to management of contacts guidance.

Primary close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period, regardless of vaccination status. Primary close contacts should be actively monitored for development of fever or COVID-19 symptoms during this period, where feasible, and should be tested if symptoms develop. Primary close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

Routine testing is required for international travellers, international aircrew, COVID-19 quarantine and isolation facility workers and primary close contacts in quarantine.

For detailed guidance on laboratory testing for SARS-COV-2, please refer to *Public Health Laboratory Network Publications*.

2. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 80% sequence identity to SARS-CoV-1 (1, 2).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (3).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (4). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (4).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings, in the context of certain behaviours, such as singing and shouting (5) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (4). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact

with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (6, 7). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (8).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4 (9). R_0 for confined settings may be at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (10, 11).

SARS-CoV-2 variants of concern or interest

All viruses, including SARS-CoV-2, change over time. Most mutations won't significantly alter the behaviour of the virus. However occasionally, changes may provide either a biological advantage or disadvantage to virus propagation (12).

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (13, 14). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information please see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

Some SARS-CoV-2 VOC have demonstrated the potential for escape from immune recognition. In vitro studies of some variants with the E484K mutation have shown evasion of neutralising antibodies in convalescent sera of individuals previously infected with non-variant SARS-CoV-2. Further studies are required to understand the impact of VOC on the risk of re-infection and vaccine effectiveness (15, 16).

The Communicable Diseases Genomics Network is actively monitoring variants and their reported mutations to understand how these may influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see Infection Control Expert Group (ICEG) endorsed infection control guidance.

Incubation period

The majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (17-19). Around 1% of COVID-19 cases will develop symptoms more than 14 days after exposure (20). The advice in this guideline uses an upper range of 14 days to guide public health measures such as quarantine and isolation. There is currently insufficient high-quality evidence to determine how the incubation period for emerging variants of concern may differ from other lineages.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (21, 22). Pre-symptomatic transmission can occur 1-3 days before symptom onset (23, 24). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (25).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (22). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (25). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (26).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the public health unit (PHU). Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (27-29). Other symptoms include headache, sore throat, fatigue, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (1, 27-29). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (30).

The clinical presentation of COVID-19 differs from influenza, as the former typically presents with fever, then cough followed by myalgia, headache, and sore throat while the latter more commonly initiates with cough (31).

Recent studies have reported the clinical characteristics of patients with COVID-19. Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (32, 33). Older adults are at increased risk of severe disease compared with younger individuals due to age-related vulnerabilities (34, 35). While those with comorbid conditions have a higher incidence of severe or fatal outcomes, there are few studies investigating the relationship between severity and mortality of COVID-19 in the context of comorbidities (33).

COVID-19 is generally a mild disease in children, with the risk of severe disease being almost 25 times greater in adults (36, 37). A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (38).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. Some individuals remain asymptomatic throughout infection.

Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (21, 22, 39-42).

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (43). Reported long-term symptoms, include fatigue, headache, attention disorder, mood changes, chest pain, palpitations, hair loss, and dyspnoea (43, 44). Fatigue is the most common long-term symptom affecting around 58% of individuals (43). For individuals who experience loss of smell and/or taste as a result of COVID-19, most regain these senses within the first 28 days following infection but up to a quarter experience longer-lasting dysfunction (45). Long-term symptoms following COVID-19 are more likely with increasing age, body mass index and female sex (46).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.1% (47). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems on patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is 1.9% (based on surveillance data notified in Australia as of 31 August 2021). As of 31 August 2021, 69% (695/1006) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (48).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (48). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (15, 48).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (15). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (15). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Vaccination

The SARS-CoV-2 vaccination program commenced in Australia on 22 February 2021. The Therapeutic Goods Administration has approved AstraZeneca (Vaxzevria) ChAdOx1-S and Pfizer Australia - COMIRNATY BNT162b2 (mRNA) vaccines for distribution within Australia. Currently available evidence demonstrates that both AstraZeneca and Pfizer vaccines are effective in reducing the incidence and severity of COVID-19 (49).

It is not yet clear how widespread vaccination will affect the risk of SARS-CoV-2 transmission. Additionally, evidence is still emerging on vaccine effectiveness, including effectiveness following first and second doses (50).

The Australian Technical Advisory Group on Immunisation (ATAGI) has noted evidence of a rare but serious side effect involving thrombosis (clotting) with thrombocytopenia (low blood platelet count) following receipt of the AstraZeneca vaccine. ATAGI recommends the Pfizer vaccine as the preferred vaccine for adults aged under 50 years. For more information, see *ATAGI statement on AstraZeneca vaccine in response to new vaccine safety concerns*.

The safety and effectiveness of COVID-19 vaccination programs in Australia and overseas is being monitored closely in the context of how vaccination may impact upon the optimal public health management of COVID-19.

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)

- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

Disease occurrence and public health significance

Cases of COVID-19 were initially thought to be associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 31 August 2021, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 216.3 million confirmed cases and over 4.4 million deaths (47).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (51), and declared a pandemic on 12 March 2020 (52).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared healthcare services and laboratories for a targeted response. The *Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19)* details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the *Biosecurity (Listed Human Diseases) Determination 2016* as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the AHPPC. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

3. Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. See *COVID-19 FAQs- international travellers to Australia*.

Jurisdictions will also conduct testing in COVID-19 quarantine and isolation facilities, for more information see Testing section.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practising effective hand hygiene and respiratory hygiene;
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants;
- Staying home and not attending public places including work or school if unwell;
- Maintaining a distance of 1.5 m from people when in public; and
- Wearing a face mask in situations where physical distancing cannot be maintained.

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

During outbreaks or in the presence of sustained community transmission, the use of masks in the community can supplement other control measures.

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.

- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to ‘stay at home’ requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

4. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

5. Cases

Definitions

Reporting

Both confirmed cases and historical cases should be notified in the jurisdiction of diagnosis.

People who meet the confirmed or historical case criteria who have previously been diagnosed and managed overseas or in another Australian jurisdiction do not need to be re-notified. In this situation, documented evidence of diagnosis overseas or interstate must be provided to the PHU.

Confirmed case

The confirmed case definition is intended to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Historical case

The historical case definition is intended to capture cases who have been infected sometime in the past that have not been previously reported and are not considered infectious at the time of diagnosis. Further laboratory testing is required to meet this criterion.

A historical case requires:

i. Laboratory evidence to support a historic infection; **AND**

ii. Absence of clinical evidence in the 14 days prior to swab date of positive test

Laboratory evidence of historic infection:

1. For people who have not been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3]; **AND**
    - A subsequent PCR is negative OR suggestive of a historical infection[3], taken at least 24 hours apart; **AND**
    - Detection of IgG or total antibody[2];

    OR

2. For people who have been vaccinated:

- Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3]; **AND**
- A subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence

- Fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] ; or
- Loss of smell or loss of taste.

Suspect case

The suspect case definition is intended to identify those who may have an increased likelihood of current SARS-CoV-2 infection. Suspect cases may require specific infection prevention and control measures and public health management. Suspect cases do not need to be notified to the NNDSS.

A suspect case is a person who meets the below **clinical** and **epidemiological** criteria.

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and/or patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

Clinical evidence (in the past 14 days):

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4]; or
- Loss of smell or loss of taste.

Epidemiological evidence (in the past 14 days):

- Close contact with a confirmed case (refer to Close contacts below)
- International travel, with the exception of green zone countries (e.g. New Zealand)
- Workers supporting designated COVID-19 quarantine and isolation services
- International border staff
- International air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2.

Notes:

[1] There is possibility for false negative PCR results in children, as some children may be found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (53). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[3] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

[4] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

To guide local approaches to testing, please refer to the *CDNA and PHLN Testing Framework for COVID-19 in Australia* (Testing Framework). The Testing Framework identifies key priority groups for targeted testing based on the likelihood of infection and the epidemiological situation. The Testing Framework also provides guidance on appropriate test types based on specific circumstances. Jurisdictions can apply this guidance according to their local context.

All jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures and guidance, see ICEG-endorsed infection control guidance.

Approach to specimen collection and testing for SARS-CoV-2

Laboratory testing for SARS-CoV-2 is important for individual patient diagnosis, and to guide infection prevention and control procedures and public health investigations. The main sample types submitted for testing are respiratory tract samples (upper and lower tract) and sera. Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) is the method of choice to detect SARS-CoV-2 during the acute illness.

Serology may be useful for diagnosis of historical COVID-19 cases, further investigation where nucleic acid testing is negative, and research purposes. However, currently no serological assays can reliably prove immunity to SARS-CoV-2 and the ability of serology to detect anti-spike antibody following vaccination for COVID-19 is unknown. The detection of anti-spike antibody cannot distinguish between natural infection and vaccination. Routine diagnostic serological testing is not recommended following COVID-19 vaccination.

Routine tests for acute pneumonia/pneumonitis should be requested where indicated and according to local protocols. This may include bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for other respiratory pathogens.

The occurrence of viral coinfection in SARS-CoV-2 has been negligible in Australia to date. However, if SARS-CoV-2 is not detected, testing for other common respiratory viruses in a person with an acute respiratory tract infection may be clinically appropriate.

For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; or the different types of SARS-CoV-2 specific testing, please refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Refer to *PHLN guidance on laboratory testing for SARS-CoV-2* and Genome sequencing for all cases for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Where no other clinical focus of infection or alternate explanation of the patient's illness is evident, testing beyond the suspect case definition should be undertaken on persons with:

- fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills); or
- loss of smell or loss of taste; or
- acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement of the treating clinician should inform if testing beyond the suspect case definition may include individuals with sudden and unexplained onset of one or more of these other symptoms.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions will conduct routine testing of international travellers who are in hotel quarantine. Testing should occur on day 0–2 and then on day 12-14, preferably as late as possible, of hotel quarantine. Some jurisdictions may undertake mid-quarantine testing for

earlier identification of cases. Results must be received prior to release from quarantine. Travellers should be tested 2 to 3 days after leaving managed quarantine.

Exact arrangements for post-quarantine testing depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – international travellers.

COVID-19 quarantine and isolation facility workers

All COVID-19 quarantine and isolation facility workers (e.g. health staff concierge, transport staff, police, security guards, cleaners, food and beverage etc.) are required to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

It is mandatory for all quarantine workers to receive COVID-19 vaccination. This includes anyone who works in places of high infection risk related to the international border (i.e. red zones). In line with Australia's COVID-19 vaccine national rollout phases, household and close contacts of quarantine workers are eligible for COVID-19 vaccination and should be strongly encouraged to receive it. Jurisdictions may implement additional requirements for quarantine workers. See Australian Health Protection Principal Committee (AHPPC) statement on National Principles for Managed Quarantine.

Testing in healthcare settings

Jurisdictions may consider requesting routine testing of staff in healthcare settings, in addition to other control strategies, where COVID-19 cases are treated or where there is community transmission. Periodic and comprehensive screening of staff in healthcare settings can assist in earlier identification of infection in healthcare environments.

Routine testing of staff in healthcare settings is recommended on a voluntary basis. However jurisdictions may determine the triggers for when routine testing is implemented and consider mandatory testing in certain high-risk situations. Jurisdictions may also determine the appropriate frequency and method for routine testing, depending on the specific circumstances.

Staff in healthcare settings who may be considered for routine testing may include staff who:

- directly care for COVID-19 patients
- work at COVID-19 testing sites
- provide occasional or intermittent care to COVID-19 patients (e.g. medical consulting units, pharmacists, allied health)
- work within the patient/client/resident zone for COVID-19 patients (e.g. ward clerks, cleaners, pharmacy deliveries, food delivery)
- transport a COVID-19 patient to a healthcare setting
- work in high risk areas of the hospital that don't have confirmed cases (e.g. staff in emergency departments)

- work in community health centres (e.g. GP led respiratory or fever clinics)

Provided they do not have COVID-19 symptoms and are not a primary close contact, staff in healthcare settings who undergo routine testing are not required to isolate whilst awaiting a negative result and may continue to work.

If staff are away from work for 7 days or more, they may be requested to undertake a COVID-19 test with oropharyngeal and deep nasal or nasopharyngeal swabs. E.g. Every 7 days while away until 14 days have passed since they were last at work.

Jurisdictions may also need to consider testing requirements for staff:

- working across wards or campuses
- working between hospitals/jobs
- who are inpatients or outpatients
- visiting high-risk settings such as hospitals or aged care facilities

The need for routine testing in these circumstances should be assessed case-by-case, giving consideration to the associated level of risk.

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHU should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Post testing instructions and isolation requirements for people with symptoms that may be due to COVID-19

Jurisdictions should give clear instructions on isolation requirements after COVID-19 testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

Individuals must follow all relevant post-testing instructions regardless of vaccination status.

Healthcare workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Healthcare workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Factors to consider

Post-testing instructions and the level of isolation required after testing should consider the following factors:

- Epidemiological context

- Whether the person is symptomatic
- Potential risk of transmission of undiagnosed COVID-19
- The public health risk of creating a barrier to testing

Post-testing instructions and isolation requirements

PHUs may divide instructions on isolation requirements after testing into two groups:

1. People with a clinically compatible illness who are not in quarantine
2. People with a clinically compatible illness who are in quarantine

1. For people with a clinically compatible illness who are not in quarantine:

- The person should stay at home until a negative test is returned AND symptoms have resolved[1].
- Whilst staying at home and waiting for a negative test, they should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
- Their household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions when there is community transmission:

- Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

2. For people with a clinically compatible illness who are in quarantine:

- The person should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- They must remain in quarantine for the pre-determined period as determined by the relevant PHU, regardless of negative test result.

Notes:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the

laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is when there is a lack of an epidemiological risk factor for acquisition of COVID-19, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the PHUs first contact the laboratory microbiologist to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in close collaboration with the laboratory microbiologist and the treating clinician:

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from primary close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify ‘potential source contacts’.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed or suspect cases:

Begin follow up investigation of confirmed or suspect cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Case interviews, exposure site identification and primary close contact identification should be completed within 1 day of notification of a confirmed case.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Historical cases:

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined that the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information see Identification of potential source contacts.

Response procedure

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 (54, 55), whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case.
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Record vaccination status including vaccine type, date and country of administration.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing, aiming for identified primary close contacts to be placed in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities as transmission between humans and animals has been observed (56).

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.
4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic

and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Personal protective equipment

To minimise the risk of transmission from hospitalised COVID-19 patients, PHU should encourage hospitals to undertake a system based risk assessment. Risk can be managed by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Confirmed cases who are hospitalised should be isolated in a negative pressure room with anteroom, where available. If a negative pressure room is not available, a standard isolation room or single room with negative airflow can be used. Avoid rooms with positive pressure airflow. Where there is concern about the appropriateness of the room used, PHU may undertake risk assessment to determine whether staff, visitors and other patients, should be considered close or casual contacts.

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital (see above), at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;

- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- There is a reasonable level of confidence of the compliance of the case.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. See Release from isolation for further information.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection prevention and control precautions, pending further testing (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are primary close contacts or are required to quarantine for other purposes (e.g. international travel) must continue to quarantine for the remainder of the 14-day period, regardless of any negative.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another pathogen.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, testing for other respiratory pathogens should be performed.

The following criteria can be used to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .

4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHU and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms that do not report Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Release from isolation criteria for all confirmed cases who do not meet historical infection criteria

Note: Revisions to the release from isolation criteria have been made due to the significant increase in number of cases infected with SARS-CoV-2 variants of concern in Australia.

The following information details the circumstances under which all confirmed cases can be released from isolation. This includes confirmed cases infected with a SARS-CoV-2 variant of concern.

Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2, or 3 – whichever is applicable.

Significantly immunocompromised cases will also need to meet additional criterion in point 4 in order to be released from isolation.

Where all clinical criteria are met for points 1 or 2 below, some cases may be eligible for early release from isolation after day 10 from symptom onset if:

- PCR is negative; or
- detection of SARS-CoV-2 specific IgG or total antibodies on serology, in the absence of vaccination.

1. Confirmed cases who have remained asymptomatic

The case can be released from isolation if at least 14 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with resolution of fever and acute respiratory symptoms

The case can be released from isolation if they meet all of the following criteria:

- at least 14 days have passed since the onset of symptoms; and
- there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]

3. Confirmed cases without complete resolution of fever and acute respiratory symptoms

The case can be released from isolation if they meet **both** of the following criteria:

- at least 20 days have passed since the onset of symptoms; and
- the case is not significantly immunocompromised[3]

OR

The case can also be released from isolation if they meet **all** the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
- the case has had two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 10 from symptom onset.

4. Significantly immunocompromised persons

In addition to meeting the appropriate criteria described in points 1 or 2 above, persons who are significantly immunocompromised[3] and are identified as confirmed cases must meet a higher standard requiring additional assessment.

They can be released from isolation when they meet the following additional criterion:

- PCR negative[2] on at least two consecutive respiratory specimens collected at least 24 hours apart after day 7 from symptom onset[4].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). This should be discussed with the treating medical practitioner, the testing laboratory and public health unit.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have

had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Testing post-release from isolation

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case has not re-developed COVID-19 symptoms but is swabbed and tests positive after they have met the above release from isolation criteria, then the case does not require re-isolation. Current evidence and Australian public health experience indicates these people are unlikely to be infectious.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness consistent with a historic infection, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Release from isolation and high-risk settings

Based on a review of available evidence, persons who fulfil the appropriate criteria above are not considered to be infectious, including those infected with a variant of concern (57-61). Cases returning to a high risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential age care setting, or who regularly attend healthcare settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note that for patients who are being transferred to another ward or hospital, they should remain in isolation with transmission-based precautions and appropriate PPE until the above criteria (point 3) is met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non-COVID-19 related condition.

Release from isolation and re-exposure

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a primary close contact of a confirmed case and the re-exposure was less than 6 months since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic).

Recovered cases, unless immunocompromised, can continue to attend high-risk settings and do not need to be furloughed from work if re-exposed during this 6 month period.

For recovered cases re-exposed after 6 months from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist and/or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and healthcare workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be re-tested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Release from isolation and gastrointestinal symptoms

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested and remain persistently PCR positive in these samples after all release from isolation criteria are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised against preparing food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. healthcare workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used. Education emphasising the importance of proper hand hygiene should be provided to all cases upon release from isolation.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

6. Contacts

Close contact definitions

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. The following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact with a confirmed case during their infectious period; or
- shared a closed space with a confirmed case during their infectious period, where there is reasonable risk of transmission based on a risk assessment performed by the PHU, taking into account:
    - transmission having been proven to have readily occurred in this (or a similar) setting;
    - the specific variant of SARS-CoV-2;
    - the adequacy of air exchange in an indoor environment; or
    - the nature of the exposure (e.g. type of contact, mask use, whether shouting or singing, size of venue etc.).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the infectious period to inform identification of contacts.

Note that:

- The infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered, at the discretion of the PHU.
- Healthcare workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not generally considered to be primary close contacts, provided that appropriate PPE has been worn and there has not been a PPE breach.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact.

At the discretion of the PHU, some casual contacts may be reclassified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to individuals who do not meet the primary close contact definition.

The following factors should be considered prior to reclassifying casual contacts as primary close contacts:

- Epidemiological context, including level of community transmission.
- The specific variant of SARS-CoV-2.
- The potential for large scale amplification in the given setting or venue
- Jurisdictional capacity and resourcing requirements, including opportunity costs of managing them as close contacts
- Feasibility and resulting impacts of public health measures on essential services (e.g. provision of health care services)
- Vulnerability of the contacts.

Depending on the above factors, public health units may implement a range of options for management of casual contacts in different settings. See Management of contacts- casual contacts for further information.

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact or shared a closed space in any setting with a primary close contact of a COVID-19 case, from 24 hours after the primary contact's exposure to the case.

Identification of secondary close contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

PHU should advise primary close contacts to:

- Quarantine for 14 days following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- Monitor their health. PHUs should conduct active daily monitoring of primary close contacts for COVID-19 symptoms for 14 days after the last possible contact with a confirmed COVID-19 case. This may include daily contact via SMS.
- Get tested during the quarantine period (see below).

Primary close contacts must be advised on the processes for seeking medical care, including how to safely seek COVID-19 testing if they develop symptoms. Refer to Medical care for quarantined individuals.

At a minimum, testing of primary close contacts should occur:

1. If COVID-19 symptoms develop
2. On entry to quarantine
    - A positive test result would make the primary close contact a case and support an earlier decision to move the person to an alternative place for isolation and bring forward contact tracing for that person.
3. Before exit from quarantine
    - A positive test result late in the quarantine period (e.g. day 10–13), prevents the release of potentially infectious people into the community.
    - In some circumstances, PHU may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.
4. Mid-quarantine (where appropriate)
    - If there is reason to doubt compliance with quarantine or high risk of the primary close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Casual contacts

At a minimum, casual contacts should be provided with information about their exposure and the need to monitor for symptoms and seek testing if symptoms develop.

Depending on the circumstances, PHU may consider the following options for management of casual contacts in different settings:

1. Monitor for symptoms and test for SARS-CoV-2 if symptoms develop;
    - Applicable for casual contacts who have been in the same vicinity as a case and are considered very low risk for transmission.
2. Test for SARS-CoV-2 at around day 5 after exposure and isolate until a negative test is returned. Continue to monitor for symptoms out to 14 days post exposure.
    - Applicable for casual contacts who have been in the same setting as a case, considered low risk for transmission and useful for up-stream investigation.
3. Short term quarantine period and test for SARS-CoV-2 prior to exit from quarantine. Release from quarantine if a negative test is returned and continue to monitor for symptoms out to 14 days post exposure.
    - Applicable for casual contacts who have been in the same setting as a case and are considered medium risk for transmission.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. lives with the case, exposed at a high-risk setting where transmission has already occurred);
- The secondary close contact is unable to remain isolated from the primary close contact (e.g. one is a carer for the other or lives in the same household);
- There will be a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary close contact to become infectious prior to quarantine);
- Secondary transmission has already occurred from a primary close contact to a secondary close contact;
- There are communication challenges with close contacts; or
- The consequences of the secondary case being positive is deemed very high risk (e.g. returning to a remote community).

Secondary close contacts may be quarantined until the PHU has confirmed that the primary close contact was not infectious at the time of last contact with the secondary close contact.

Household secondary close contacts

PHU may require household secondary close contacts to quarantine until the primary close contact is cleared from quarantine.

Non-household secondary close contacts

PHU may require secondary close contacts who are in a different household to the primary close contact to remain in quarantine until 14 days from the last exposure of the primary close contact to the confirmed case.

Alternatively, PHU may require these secondary close contacts to remain in quarantine until there is confirmation that the primary close contact was not infectious at the last time of contact with the secondary close contact (e.g. if the primary close contact tests negative).

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household

- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix B: Outbreak investigation and management).

International travellers

International travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All international travellers, with the exception of travellers from green zone flights, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia and adhere to any additional jurisdictional quarantine requirements.

All international travellers who have undertaken international travel in the last 14 days who are unwell with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Testing of international travellers

Jurisdictions will conduct routine testing of international travellers who are in a managed quarantine facility. At a minimum, testing should occur on day 0–2 and then on day 12-14, preferably as late as possible, of quarantine, with results to be received prior to release from quarantine. Some jurisdictions may undertake mid-quarantine testing for earlier identification of cases. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel.

If negative test results are received, the international traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the international traveller should be isolated and managed as per the recommendations for confirmed cases.

A further test is required **2 to 3 days after** leaving managed quarantine. Some jurisdictions may choose not to test post-quarantine for extremely low risk cohorts. This measure is aimed at reducing the limited but real risk of community transmission in the unlikely circumstance that an international traveller acquired COVID-19 while in quarantine. In addition, this measure may also detect cases with an unusually long incubation period (longer than the routine 14 days). See AHPPC statement on testing travellers once they leave managed quarantine.

Provided the traveller has no COVID-19 symptoms after leaving managed quarantine, further isolation is not required from the time of leaving the quarantine facility through to receiving a negative result on the post-quarantine test. However, if the traveller develops COVID-19 symptoms within 14 days after leaving managed quarantine, they must arrange to have a COVID-19 test as soon as possible and isolate until a negative result is received. Quarantine programs should provide international travellers with information alerting them to these requirements.

Aircraft passengers and crew

Passengers

At a minimum, all aircraft passengers who were seated in the same row or two rows in front or behind a confirmed case during the case's infectious period are considered primary close contacts. If the confirmed case was infected with a more transmissible SARS-CoV-2 variant of concern, PHUs should classify all passengers on board the flight as primary close contacts. Similar criteria can be used for people who have had close contact on bus or train trips.

Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport.

Crew

For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify which crew members should be considered primary close contacts. Refer to Appendix C and Appendix D for further information.

Health and residential care workers

Health and residential care workers with influenza-like illness should not work while they are symptomatic. They should be tested for SARS-CoV-2 and undergo isolation pending results.

Infection prevention and control units of health and residential care facilities may assist PHUs to identify and monitor health and residential care worker close contacts.

It is recognised that clinical work restrictions on primary close contacts who are health or residential care workers may place strain on individuals and on the delivery of health services. This underlines the importance of ensuring health and residential care workers implement appropriate infection prevention and control precautions when in close contact with confirmed and suspect COVID-19 cases. For detailed guidance on infection prevention and control, please refer to Infection Control Expert Group-endorsed infection prevention and control guidance.

In settings where the loss of the health and residential care worker will have a significant impact on health or residential care services, an individual risk assessment should be conducted in collaboration with the PHU.

Risk assessment of health and residential care workers

Where there are concerns regarding appropriate PPE use by the health or residential care worker and/or the case, a risk assessment should be performed to determine whether the contact was sufficient to warrant treatment as a primary close contact or a casual contact (with potential for testing and/or quarantine), see *Tables 2a* and *2b* below.

Factors that may be considered include:

- Details of related transmission events in the outbreak.
- Vaccination status.
- Case details: presence of symptoms and timing of exposure in relation to symptom onset; high-risk behaviours (e.g. shouting, singing, wandering).

- Contact details: physical distancing, length of exposure time either directly to the case or within a shared closed space.
- PPE: use of PPE by the case and contact, appropriate PPE use and any reports or suspicion of PPE breaches.
- High risk procedures: if aerosol generating procedures were performed without appropriate PPE use.
- Environment: use of shared equipment (e.g. computers on wheels, pagers) and use of communal spaces (e.g. tea rooms, flight decks, work stations).
- Staff mobility: if staff work across multiple facilities or are highly mobile within the facility (e.g. security guards or cleaning staff).

Table 2a. Risk assessment matrix – PPE and type of exposure

		Exposure			
		Aerosol generating procedures	**Close contact** (See Close contact definition)	**Environmental contamination and/or working in COVID-19 treatment or testing facility**	**Casual contact** (contact not meeting the Close contact definition)
Contact PPE	**No PPE**	High risk	High risk	Conduct individual risk assessment	Conduct individual risk assessment
	Surgical mask only	High risk	High risk	Conduct individual risk assessment	Low risk
	Mask and eye protection only	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Other PPE concerns e.g. incorrect	High risk	Conduct individual risk assessment	Conduct individual risk assessment	Low risk
	Appropriate PPE as per latest guidance	Low risk	Low risk	Low risk	Low risk

Note that:

- PHU should consider vaccination status as a component of risk assessment.

- Exposure must have occurred in the period from 48 hours before onset of symptoms in the case (or first positive PCR test if asymptomatic) until the case is deemed no longer infectious. In some high-risk settings, PHUs may opt for a more precautionary approach and use a time period of 72 hours prior to the case's symptom onset (or first positive PCR test if asymptomatic). Refer to Close contact definition for further information.

Table 2b. Actions following assessments of high or low risk*

High risk	Low risk
• Quarantine for 14 days as a close contact • Test if symptomatic at any time • Test upon entry or exit to quarantine as per jurisdictional practices	• Test and isolate until result received • Continue to work if negative • Health or residential care worker to be alert to mild symptoms • Test only if symptomatic or as part of outbreak response

*In circumstances where a risk assessment is indeterminate, it may be appropriate to adopt low risk actions with the addition of testing the health or residential care worker, and return of a negative result, prior to continuation of work.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who may be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any healthcare setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case,

the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

7. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

8. Special situations

Use of COVID-19 vaccination in outbreak situations

During COVID-19 outbreaks[1], targeted vaccination of identified, unvaccinated individuals at risk of exposure may supplement existing public health interventions. Examples of groups where targeted vaccination may occur include: individuals in closed populations, population groups with low vaccine coverage, or groups that are at higher risk of severe outcomes.

COVID-19 vaccination may be used for two purposes in the context of an outbreak:

1. As an outbreak management strategy to reduce the number and severity of COVID-19 cases associated with an outbreak, where there is likely to be an ongoing risk of exposure.
2. To opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

COVID-19 vaccination in outbreak management

There is no evidence to support the use of COVID-19 vaccination in first generation close contacts for the purpose of post-exposure prophylaxis. It takes around 14 days for a protective effect to be seen following the first dose of both the Pfizer and AstraZeneca vaccines (62). Vaccination as an outbreak response tool is likely to be of highest utility in closed settings and where there is an ongoing risk of exposure which may cause multiple chains of transmission, such as residential aged care facilities or correctional facilities. In this context, vaccination may be considered for unvaccinated individuals with the goals of:

- Direct protection against severe outcomes and death among those who receive vaccination.
- Limiting outbreak size and duration by reducing the risk of onward transmission, and thereby reducing morbidity/mortality/demand on clinical and public health resources.

Decision-making around the use of COVID-19 vaccines during outbreaks should consider the following key principles:

- The location, outbreak context, local epidemiology and likelihood of ongoing risk of exposure (beyond 14 days following vaccination) must be considered in the development of an outbreak vaccination strategy.
- The target population for vaccination should be clearly defined.
- Where there is constrained vaccine supply, priority should be given to those:
    - who have not yet received a first dose of vaccine.
    - at risk of severe outcomes or in whom non-pharmaceutical interventions are not possible (such as those unable to physically distance).
    - at highest risk of transmission of SARS-CoV-2.
- Evaluation should be undertaken after the conclusion of the outbreak.

Opportunistic vaccination

In geographic areas where an outbreak is occurring, opportunistic vaccination of eligible groups may be used to improve vaccination coverage in the population. An outbreak presents an opportunity to promote the benefits of COVID-19 vaccination to the broader community.

Note:

1 For the purposes of vaccination during outbreaks, an outbreak is defined as a single confirmed case of COVID-19 in the community. Individual jurisdictions' outbreak definitions may differ.

Aircrew

Testing and quarantine

Aircrew flying on international flights are required to be tested on arrival or undergo a COVID-19 test in Australia every 7 days, as directed by individual jurisdictions.

International aircrew arriving into Australia, who are not Australian-based (ie. local residents), need to quarantine in a dedicated quarantine facility either between international flights or for 14 days, whichever is the shortest. Aircrew who are local residents and who enter Australia in their state of residence may be allowed to quarantine at home for 14 days or until their next international flight. For more information, see *AHPPC statement on safe air travel – enhancing end-to-end mitigations – international*.

Risk assessment and identification of contacts

Decisions regarding the contact classification of cabin crews can be difficult to determine. On an aircraft with one or more confirmed cases of COVID-19, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew should be managed as primary close contacts.

Considerations for conducting a risk assessment should include:

- Infection prevention and control, including appropriate use of PPE
- Variants of concern
- Proximity of crew to confirmed cases
- Duration of exposure to confirmed cases
- Size of the compartment in which the crew member and confirmed case interacted
- The number of confirmed cases of COVID-19 on board
- Potential breaches of PPE

When the case is in a crew member, similar principles can be applied to identify passengers and crew who should be managed as primary close contacts.

Where it has been determined that a crew member is a primary close contact, the airline is responsible for notifying the relevant state/territory public health authority to facilitate management of the close contact. For further information, refer to Appendix C: Risk assessment and identification of close contacts in aircrew.

Management of aircrew

Please see Appendix D: Guidance on the management of aircrew for information on management of aircrew including:

- Aircrew who test positive for SARS-CoV-2 in Australia;
- Aircrew who are a close contact of a person with confirmed COVID-19;
- Returning aircrew who are primary close contacts;
- Aircrew with historical infections; and
- Onward domestic travel of aircrew who are Australian residents.

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All international travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Organ donation and transplantation

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix E.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and healthcare workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances where all alternative surge workforce strategies are exhausted and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (63). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers by degree of exposure, including prioritisation of return to work in staff whose exposure is assessed to be less substantial (e.g. less cumulative duration of exposure to confirmed cases, use of PPE during contact with confirmed cases). PHU may also consider vaccination status as a component of risk assessment.
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Outbreak investigation and management

Appendix C: Risk assessment and identification of close contacts in aircrew

Appendix D: Guidance on the management of aircrew

Appendix E: Organ donation and transplantation

Appendix F: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
- infection control measures being used in caring for the case, and
- home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all primary close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to High-risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHU should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHU are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHU should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHU should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of primary close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be primary close contacts. These include, staff, residents (if relevant) and visitors.

PHU may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHU should ensure all primary close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHU may also require secondary close contacts or casual contacts to quarantine.

I. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

I. Assess and record vaccination status

During outbreak investigations, it is important PHU assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities*. While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.

Detailed information on environmental cleaning and disinfection in health and residential care settings is in the *COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet*. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a) With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b) In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c) Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort on Retest Day/s**
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHU should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix C: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are primary close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew primary close contacts. For more information on contact tracing of aircraft passengers see Close Contacts- Aircraft passengers and crew.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify primary close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a primary close contact:
    - Face-to-face contact of any duration with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as primary close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHU should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as primary close contacts.

Additional considerations for conducting a risk assessment should include:

1. **Variants of concern**
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

2. **Proximity of crew to confirmed cases**
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered primary close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. **Duration of exposure to confirmed cases**
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered primary close contacts.

4. **Size of the compartment in which the crew and confirmed case interacted**
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered primary close contacts.

5. **The number of confirmed cases of COVID-19 on board**
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. **Potential breaches of PPE**
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered primary close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered primary close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

Aircrew and passengers who are primary close contacts

If an airline becomes aware of a crew member or passenger who was a primary close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix D: Guidance on the management of aircrew.

Appendix D: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Air crew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix E: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (64-67).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (64).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to *the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals*.

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see *PHLN guidance on laboratory testing for SARS-CoV-2).*

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix F: Full revision history of the COVID-19 SoNG

Revision history

Version	Date	Revised by	Changes
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case

Version	Date	Revised by	Changes
			management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.

Version	Date	Revised by	Changes
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.

Version	Date	Revised by	Changes
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.

Version	Date	Revised by	Changes
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 5.0

06 October 2021

Summary of revision history

For full revision history, please refer to Appendix G

Version	Date	Revised by	Changes
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status. All newly confirmed cases should undergo whole genome sequencing.

Confirmed cases who are hospitalised should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of patients with confirmed or suspected COVID-19, including personal protective equipment, see ICEG-endorsed infection control guidance.

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information, see Identification of potential source contacts.

Contact management

Close contacts should be managed according to management of contacts guidance.

Primary close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period, regardless of vaccination status. Primary close contacts should be actively monitored for development of fever or COVID-19 symptoms during this period, where feasible, and should be tested if symptoms develop. Primary close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

Routine testing is required for international travellers, international aircrew, COVID-19 quarantine and isolation facility workers and primary close contacts in quarantine.

For detailed guidance on laboratory testing for SARS-COV-2, please refer to *Public Health Laboratory Network Publications*.

2. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 80% sequence identity to SARS-CoV-1 (1, 2).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (3).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (4). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (4).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings, in the context of certain behaviours, such as singing and shouting (5) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (4). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact

with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (6, 7). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (8).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4 (9). R_0 for confined settings may be at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (10, 11).

SARS-CoV-2 variants of concern or interest

All viruses, including SARS-CoV-2, change over time. Most mutations won't significantly alter the behaviour of the virus. However occasionally, changes may provide either a biological advantage or disadvantage to virus propagation (12).

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (13, 14). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information please see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

Some SARS-CoV-2 VOC have demonstrated the potential for escape from immune recognition. In vitro studies of some variants with the E484K mutation have shown evasion of neutralising antibodies in convalescent sera of individuals previously infected with non-variant SARS-CoV-2. Further studies are required to understand the impact of VOC on the risk of re-infection and vaccine effectiveness (15, 16).

The Communicable Diseases Genomics Network is actively monitoring variants and their reported mutations to understand how these may influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see Infection Control Expert Group (ICEG) endorsed infection control guidance.

Incubation period

The majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (17-19). Around 1% of COVID-19 cases will develop symptoms more than 14 days after exposure (20). The advice in this guideline uses an upper range of 14 days to guide public health measures such as quarantine and isolation. There is currently insufficient high-quality evidence to determine how the incubation period for emerging variants of concern may differ from other lineages.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (21, 22). Pre-symptomatic transmission can occur 1-3 days before symptom onset (23, 24). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (25).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (22). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (25). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (26).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the public health unit (PHU). Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (27-29). Other symptoms include headache, sore throat, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (1, 27-29). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (30).

The clinical presentation of COVID-19 differs from influenza, as the former typically presents with fever, then cough followed by myalgia, headache, and sore throat while the latter more commonly initiates with cough (31).

Recent studies have reported the clinical characteristics of patients with COVID-19. Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (32, 33). Older adults are at increased risk of severe disease compared with younger individuals due to age-related vulnerabilities (34, 35). While those with comorbid conditions have a higher incidence of severe or fatal outcomes, there are few studies investigating the relationship between severity and mortality of COVID-19 in the context of comorbidities (33).

COVID-19 is generally a mild disease in children, with the risk of severe disease being almost 25 times greater in adults (36, 37). A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (38).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. Some individuals remain asymptomatic throughout infection.

Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (21, 22, 39-42).

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (43). Reported long-term symptoms, include fatigue, headache, attention disorder, mood changes, chest pain, palpitations, hair loss, and dyspnoea (43, 44). Fatigue is the most common long-term symptom affecting around 58% of individuals (43). For individuals who experience loss of smell and/or taste as a result of COVID-19, most regain these senses within the first 28 days following infection but up to a quarter experience longer-lasting dysfunction (45). Long-term symptoms following COVID-19 are more likely with increasing age, body mass index and female sex (46).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.0% (47). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems on patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is 1.2% (based on surveillance data notified in Australia as of 05 October 2021). As of 05 October 2021, 54% (735/1357) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (48).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (48). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (15, 48).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (15). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (15). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Vaccination

The SARS-CoV-2 vaccination program commenced in Australia on 22 February 2021. The Therapeutic Goods Administration has approved AstraZeneca (Vaxzevria) ChAdOx1-S and Pfizer Australia - COMIRNATY BNT162b2 (mRNA) vaccines for distribution within Australia. Currently available evidence demonstrates that both AstraZeneca and Pfizer vaccines are effective in reducing the incidence and severity of COVID-19 (49).

It is not yet clear how widespread vaccination will affect the risk of SARS-CoV-2 transmission. Additionally, evidence is still emerging on vaccine effectiveness, including effectiveness following first and second doses (50).

The Australian Technical Advisory Group on Immunisation (ATAGI) has noted evidence of a rare but serious side effect involving thrombosis (clotting) with thrombocytopenia (low blood platelet count) following receipt of the AstraZeneca vaccine. ATAGI recommends the Pfizer vaccine as the preferred vaccine for adults aged under 50 years. For more information, see *ATAGI statement on AstraZeneca vaccine in response to new vaccine safety concerns*.

The safety and effectiveness of COVID-19 vaccination programs in Australia and overseas is being monitored closely in the context of how vaccination may impact upon the optimal public health management of COVID-19.

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)

- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

Disease occurrence and public health significance

Cases of COVID-19 were initially thought to be associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 05 October 2021, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 235.2 million confirmed cases and over 4.8 million deaths (47).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (51), and declared a pandemic on 12 March 2020 (52).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared health care services and laboratories for a targeted response. The *Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19)* details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the *Biosecurity (Listed Human Diseases) Determination 2016* as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the AHPPC. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

3. Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. See *COVID-19 FAQs- international travellers to Australia*.

Jurisdictions will also conduct testing in COVID-19 quarantine and isolation facilities, for more information see Testing section.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practising effective hand hygiene and respiratory hygiene;
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants;
- Staying home and not attending public places including work or school if unwell;
- Maintaining a distance of 1.5 m from people when in public; and
- Wearing a face mask in situations where physical distancing cannot be maintained.

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

During outbreaks or in the presence of sustained community transmission, the use of masks in the community can supplement other control measures.

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.

- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to ‘stay at home’ requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

4. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

5. Cases

Definitions

Reporting

Both confirmed cases and historical cases should be notified in the jurisdiction of diagnosis.

People who meet the confirmed or historical case criteria who have previously been diagnosed and managed overseas or in another Australian jurisdiction do not need to be re-notified. In this situation, documented evidence of diagnosis overseas or interstate must be provided to the PHU.

Confirmed case

The confirmed case definition is intended to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Historical case

The historical case definition is intended to capture cases who have been infected sometime in the past that have not been previously reported and are not considered infectious at the time of diagnosis. Further laboratory testing is required to meet this criterion.

A historical case requires:

i. Laboratory evidence to support a historic infection; **AND**

ii. Absence of clinical evidence in the 14 days prior to swab date of positive test

Laboratory evidence of historic infection:

1. For people who have not been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3]; **AND**
    - A subsequent PCR is negative OR suggestive of a historical infection[3], taken at least 24 hours apart; **AND**
    - Detection of IgG or total antibody[2];

OR

2. For people who have been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3]; **AND**
    - A subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence

- Fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] ; or
- Loss of smell or loss of taste.

Suspect case

The suspect case definition is intended to identify those who may have an increased likelihood of current SARS-CoV-2 infection. Suspect cases may require specific infection prevention and control measures and public health management. Suspect cases do not need to be notified to the NNDSS.

A suspect case is a person who meets the below **clinical** and **epidemiological** criteria.

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and/or patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

Clinical evidence (in the past 14 days):

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4]; or
- Loss of smell or loss of taste.

Epidemiological evidence (in the past 14 days):

- Close contact with a confirmed case (refer to Close contacts below)
- International travel, with the exception of green zone countries (e.g. New Zealand)
- Workers supporting designated COVID-19 quarantine and isolation services
- International border staff
- International air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2.

Notes:

[1] There is possibility for false negative PCR results in children, as some children may be found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (53). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[3] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

[4] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

To guide local approaches to testing, please refer to the *CDNA and PHLN Testing Framework for COVID-19 in Australia* (Testing Framework). The Testing Framework identifies key priority groups for targeted testing based on the likelihood of infection and the epidemiological situation. The Testing Framework also provides guidance on appropriate test types based on specific circumstances. Jurisdictions can apply this guidance according to their local context.

All jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures and guidance, see ICEG-endorsed infection control guidance.

Approach to specimen collection and testing for SARS-CoV-2

Laboratory testing for SARS-CoV-2 is important for individual patient diagnosis, and to guide infection prevention and control procedures and public health investigations. The main sample types submitted for testing are respiratory tract samples (upper and lower tract) and sera. Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) is the method of choice to detect SARS-CoV-2 during the acute illness.

Serology may be useful for diagnosis of historical COVID-19 cases, further investigation where nucleic acid testing is negative, and research purposes. However, currently no serological assays can reliably prove immunity to SARS-CoV-2 and the ability of serology to detect anti-spike antibody following vaccination for COVID-19 is unknown. The detection of anti-spike antibody cannot distinguish between natural infection and vaccination. Routine diagnostic serological testing is not recommended following COVID-19 vaccination.

Routine tests for acute pneumonia/pneumonitis should be requested where indicated and according to local protocols. This may include bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for other respiratory pathogens.

The occurrence of viral coinfection in SARS-CoV-2 has been negligible in Australia to date. However, if SARS-CoV-2 is not detected, testing for other common respiratory viruses in a person with an acute respiratory tract infection may be clinically appropriate.

For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; or the different types of SARS-CoV-2 specific testing, please refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Refer to *PHLN guidance on laboratory testing for SARS-CoV-2* and Genome sequencing for all cases for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Where no other clinical focus of infection or alternate explanation of the patient's illness is evident, testing beyond the suspect case definition should be undertaken on persons with:

- fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills); or
- loss of smell or loss of taste; or
- acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement of the treating clinician should inform if testing beyond the suspect case definition may include individuals with sudden and unexplained onset of one or more of these other symptoms.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions will conduct routine testing of international travellers who are in hotel quarantine. Testing should occur on day 0–2 and then on day 12-14, preferably as late as possible, of hotel quarantine. Some jurisdictions may undertake mid-quarantine testing for

earlier identification of cases. Results must be received prior to release from quarantine. Travellers should be tested 2 to 3 days after leaving managed quarantine.

Exact arrangements for post-quarantine testing depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – international travellers.

COVID-19 quarantine and isolation facility workers

All COVID-19 quarantine and isolation facility workers (e.g. health staff concierge, transport staff, police, security guards, cleaners, food and beverage etc.) are required to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

It is mandatory for all quarantine workers to receive COVID-19 vaccination. This includes anyone who works in places of high infection risk related to the international border (i.e. red zones). In line with Australia's COVID-19 vaccine national rollout phases, household and close contacts of quarantine workers are eligible for COVID-19 vaccination and should be strongly encouraged to receive it. Jurisdictions may implement additional requirements for quarantine workers. See Australian Health Protection Principal Committee (AHPPC) statement on National Principles for Managed Quarantine.

Testing in health care settings

Jurisdictions may consider requesting routine testing of staff in health care settings, in addition to other control strategies, where COVID-19 cases are treated or where there is community transmission. Periodic and comprehensive screening of staff in health care settings can assist in earlier identification of infection in health care environments.

Routine testing of staff in health care settings is recommended on a voluntary basis. However jurisdictions may determine the triggers for when routine testing is implemented and consider mandatory testing in certain high-risk situations. Jurisdictions may also determine the appropriate frequency and method for routine testing, depending on the specific circumstances.

Staff in health care settings who may be considered for routine testing may include staff who:

- directly care for COVID-19 patients
- work at COVID-19 testing sites
- provide occasional or intermittent care to COVID-19 patients (e.g. medical consulting units, pharmacists, allied health)
- work within the patient/client/resident zone for COVID-19 patients (e.g. ward clerks, cleaners, pharmacy deliveries, food delivery)
- transport a COVID-19 patient to a health care setting

- work in high risk areas of the hospital that don't have confirmed cases (e.g. staff in emergency departments)
- work in community health centres (e.g. GP led respiratory or fever clinics)

Provided they do not have COVID-19 symptoms and are not a primary close contact, staff in health care settings who undergo routine testing are not required to isolate whilst awaiting a negative result and may continue to work.

If staff are away from work for 7 days or more, they may be requested to undertake a COVID-19 test with oropharyngeal and deep nasal or nasopharyngeal swabs. E.g. Every 7 days while away until 14 days have passed since they were last at work.

Jurisdictions may also need to consider testing requirements for staff:

- working across wards or campuses
- working between hospitals/jobs
- who are inpatients or outpatients
- visiting high-risk settings such as hospitals or aged care facilities

The need for routine testing in these circumstances should be assessed case-by-case, giving consideration to the associated level of risk.

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHU should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Post testing instructions and isolation requirements for people with symptoms that may be due to COVID-19

Jurisdictions should give clear instructions on isolation requirements after COVID-19 testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

Individuals must follow all relevant post-testing instructions regardless of vaccination status.

Health care workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Health care workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Factors to consider

Post-testing instructions and the level of isolation required after testing should consider the following factors:

- Epidemiological context
- Whether the person is symptomatic
- Potential risk of transmission of undiagnosed COVID-19
- The public health risk of creating a barrier to testing

Post-testing instructions and isolation requirements

PHUs may divide instructions on isolation requirements after testing into two groups:

1. People with a clinically compatible illness who are not in quarantine
2. People with a clinically compatible illness who are in quarantine

1. For people with a clinically compatible illness who are not in quarantine:

- The person should stay at home until a negative test is returned AND symptoms have resolved[1].
- Whilst staying at home and waiting for a negative test, they should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
- Their household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions when there is community transmission:

- Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

2. For people with a clinically compatible illness who are in quarantine:

- The person should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- They must remain in quarantine for the pre-determined period as determined by the relevant PHU, regardless of negative test result.

Notes:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is when there is a lack of an epidemiological risk factor for acquisition of COVID-19, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the PHUs first contact the laboratory microbiologist to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another

laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in close collaboration with the laboratory microbiologist and the treating clinician:

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from primary close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify ‘potential source contacts’.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be

ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed or suspect cases:

Begin follow up investigation of confirmed or suspect cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Case interviews, exposure site identification and primary close contact identification should be completed within 1 day of notification of a confirmed case.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Historical cases:

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined that the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information see Identification of potential source contacts.

Response procedure

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 (54, 55), whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by

sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case.
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Record vaccination status including vaccine type, date and country of administration.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing, aiming for identified primary close contacts to be placed in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities as transmission between humans and animals has been observed (56).

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.

4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case,

a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Personal protective equipment

To minimise the risk of transmission from hospitalised COVID-19 patients, PHU should encourage hospitals to undertake a system based risk assessment. Risk can be managed by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Confirmed cases who are hospitalised should be isolated in a negative pressure room with anteroom, where available. If a negative pressure room is not available, a standard isolation room or single room with negative airflow can be used. Avoid rooms with positive pressure airflow. Where there is concern about the appropriateness of the room used, PHU may undertake risk assessment to determine whether staff, visitors and other patients, should be considered close or casual contacts.

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital (see above), at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- There is a reasonable level of confidence of the compliance of the case.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. See Release from isolation for further information.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection prevention and control precautions, pending further testing (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are primary close contacts or are required to quarantine for other purposes (e.g. international travel) must continue to quarantine for the remainder of the 14-day period, regardless of any negative.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another pathogen.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, testing for other respiratory pathogens should be performed.

The following criteria can be used to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.

3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHU and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms that do not report Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Release from isolation criteria for all confirmed cases who do not meet historical infection criteria

Note: Revisions to the release from isolation criteria have been made due to the significant increase in number of cases infected with SARS-CoV-2 variants of concern in Australia.

The following information details the circumstances under which all confirmed cases can be released from isolation. This includes confirmed cases infected with a SARS-CoV-2 variant of concern.

Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2, or 3 – whichever is applicable.

Significantly immunocompromised cases will also need to meet additional criterion in point 4 in order to be released from isolation.

Where all clinical criteria are met for points 1 or 2 below, some cases may be eligible for early release from isolation after day 10 from symptom onset if:

- PCR is negative; or
- detection of SARS-CoV-2 specific IgG or total antibodies on serology, in the absence of vaccination.

1. Confirmed cases who have remained asymptomatic

The case can be released from isolation if at least 14 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with resolution of fever and acute respiratory symptoms

The case can be released from isolation if they meet all of the following criteria:

- at least 14 days have passed since the onset of symptoms; and
- there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]

3. Confirmed cases without complete resolution of fever and acute respiratory symptoms

The case can be released from isolation if they meet **both** of the following criteria:

- at least 20 days have passed since the onset of symptoms; and
- the case is not significantly immunocompromised[3]

OR

The case can also be released from isolation if they meet **all** the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
- the case has had two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 10 from symptom onset.

4. Significantly immunocompromised persons

In addition to meeting the appropriate criteria described in points 1 or 2 above, persons who are significantly immunocompromised[3] and are identified as confirmed cases must meet a higher standard requiring additional assessment.

They can be released from isolation when they meet the following additional criterion:

- PCR negative[2] on at least two consecutive respiratory specimens collected at least 24 hours apart after day 7 from symptom onset[4].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). This should be discussed with the treating medical practitioner, the testing laboratory and public health unit.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Testing post-release from isolation

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case has not re-developed COVID-19 symptoms but is swabbed and tests positive after they have met the above release from isolation criteria, then the case does not require re-isolation. Current evidence and Australian public health experience indicates these people are unlikely to be infectious.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness consistent with a historic infection, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Release from isolation and high-risk settings

Based on a review of available evidence, persons who fulfil the appropriate criteria above are not considered to be infectious, including those infected with a variant of concern (57-61). Cases returning to a high-risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note: Hospitalised patients who are being transferred to another ward or hospital, should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a nonCOVID-19 related condition.

Release from isolation and re-exposure

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a primary close contact of a confirmed case and the re-exposure was less than 6 months since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic).

Recovered cases, unless immunocompromised, can continue to attend high-risk settings and do not need to be furloughed from work if re-exposed during this 6 month period.

For recovered cases re-exposed after 6 months from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist and/or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be re-tested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Release from isolation and gastrointestinal symptoms

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested and remain persistently PCR positive in these samples after all release from isolation criteria are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised against preparing food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. health care workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used.

Education emphasising the importance of proper hand hygiene should be provided to all cases upon release from isolation.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

6. Contacts

Close contact definitions

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. The following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact with a confirmed case during their infectious period; or
- shared a closed space with a confirmed case during their infectious period, where there is reasonable risk of transmission based on a risk assessment performed by the PHU, taking into account:
    - transmission having been proven to have readily occurred in this (or a similar) setting;
    - the specific variant of SARS-CoV-2;
    - the adequacy of air exchange in an indoor environment; or
    - the nature of the exposure (e.g. type of contact, mask use, whether shouting or singing, size of venue etc.).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the infectious period to inform identification of contacts.

Note that:

- The infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered, at the discretion of the PHU.
- Health care workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not generally considered to be primary close contacts, provided that appropriate PPE has been worn and there has not been a PPE breach.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact.

At the discretion of the PHU, some casual contacts may be reclassified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to individuals who do not meet the primary close contact definition.

The following factors should be considered prior to reclassifying casual contacts as primary close contacts:

- Epidemiological context, including level of community transmission.
- The specific variant of SARS-CoV-2.
- The potential for large scale amplification in the given setting or venue
- Jurisdictional capacity and resourcing requirements, including opportunity costs of managing them as close contacts
- Feasibility and resulting impacts of public health measures on essential services (e.g. provision of health care services)
- Vulnerability of the contacts.

Depending on the above factors, public health units may implement a range of options for management of casual contacts in different settings. See Management of contacts- casual contacts for further information.

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact or shared a closed space in any setting with a primary close contact of a COVID-19 case, from 24 hours after the primary contact's exposure to the case.

Identification of secondary close contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

PHU should advise primary close contacts to:

- Quarantine for 14 days following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- Monitor their health. PHUs should conduct active daily monitoring of primary close contacts for COVID-19 symptoms for 14 days after the last possible contact with a confirmed COVID-19 case. This may include daily contact via SMS.
- Get tested during the quarantine period (see below).

Primary close contacts must be advised on the processes for seeking medical care, including how to safely seek COVID-19 testing if they develop symptoms. Refer to Medical care for quarantined individuals.

At a minimum, testing of primary close contacts should occur:

1. If COVID-19 symptoms develop
2. On entry to quarantine
   - A positive test result would make the primary close contact a case and support an earlier decision to move the person to an alternative place for isolation and bring forward contact tracing for that person.
3. Before exit from quarantine
   - A positive test result late in the quarantine period (e.g. day 10–13), prevents the release of potentially infectious people into the community.
   - In some circumstances, PHU may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.
4. Mid-quarantine (where appropriate)
   - If there is reason to doubt compliance with quarantine or high risk of the primary close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Casual contacts

Depending on the circumstances, PHU may consider the following options for management of casual contacts in the community[1]:

Unvaccinated or partially vaccinated casual contacts	Fully vaccinated casual contacts[2,3]
1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events) • At a minimum, unvaccinated or partially vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required.	**1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events)** • At a minimum, fully vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required.
2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools) • Unvaccinated or partially vaccinated casual contacts may be requested to enter into a shorter term quarantine until around 5 days after exposure.	**2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • In contexts with established community transmission, fully vaccinated casual contacts do not need to quarantine.

• They should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 at day 4-5 after exposure and if symptoms develop. • The unvaccinated casual contact may exit quarantine once a negative day 4-5 PCR result is returned. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.	• They should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 at day 4-5 after exposure and if symptoms develop. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house. • Jurisdictions with no community transmission may implement more conservative approaches.

Note:

1. For guidance on management of casual contacts who are workers in healthcare settings, please see Appendix C.
2. Fully vaccinated refers to a person who is:
    a. ≥2 weeks following receipt of the second dose in a 2-dose series; and
    b. has evidence of full vaccination on the Australian Immunisation Register (AIR)
3. By PHU discretion, some individuals who were vaccinated overseas may be considered fully vaccinated. In this situation, documented evidence of overseas vaccination history must be provided to the PHU.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. lives with the case, exposed at a high-risk setting where transmission has already occurred);
- The secondary close contact is unable to remain isolated from the primary close contact (e.g. one is a carer for the other or lives in the same household);
- There will be a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary close contact to become infectious prior to quarantine);
- Secondary transmission has already occurred from a primary close contact to a secondary close contact;
- There are communication challenges with close contacts; or
- The consequences of the secondary case being positive is deemed very high risk (e.g. returning to a remote community).

Secondary close contacts may be quarantined until the PHU has confirmed that the primary close contact was not infectious at the time of last contact with the secondary close contact.

Household secondary close contacts

PHU may require household secondary close contacts to quarantine until the primary close contact is cleared from quarantine.

Non-household secondary close contacts

PHU may require secondary close contacts who are in a different household to the primary close contact to remain in quarantine until 14 days from the last exposure of the primary close contact to the confirmed case.

Alternatively, PHU may require these secondary close contacts to remain in quarantine until there is confirmation that the primary close contact was not infectious at the last time of contact with the secondary close contact (e.g. if the primary close contact tests negative).

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix B: Outbreak investigation and management).

International travellers

International travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All international travellers, with the exception of travellers from green zone flights, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia and adhere to any additional jurisdictional quarantine requirements.

All international travellers who have undertaken international travel in the last 14 days who are unwell with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Testing of international travellers

Jurisdictions will conduct routine testing of international travellers who are in a managed quarantine facility. At a minimum, testing should occur on day 0–2 and then on day 12-14, preferably as late as possible, of quarantine, with results to be received prior to release from quarantine. Some jurisdictions may undertake mid-quarantine testing for earlier identification of cases. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel.

If negative test results are received, the international traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the international traveller should be isolated and managed as per the recommendations for confirmed cases.

A further test is required **2 to 3 days after** leaving managed quarantine. Some jurisdictions may choose not to test post-quarantine for extremely low risk cohorts. This measure is aimed at reducing the limited but real risk of community transmission in the unlikely circumstance that an international traveller acquired COVID-19 while in quarantine. In addition, this measure may also detect cases with an unusually long incubation period (longer than the routine 14 days). See AHPPC statement on testing travellers once they leave managed quarantine.

Provided the traveller has no COVID-19 symptoms after leaving managed quarantine, further isolation is not required from the time of leaving the quarantine facility through to receiving a negative result on the post-quarantine test. However, if the traveller develops COVID-19 symptoms within 14 days after leaving managed quarantine, they must arrange to have a COVID-19 test as soon as possible and isolate until a negative result is received. Quarantine programs should provide international travellers with information alerting them to these requirements.

Health and residential care workers

For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, please see Appendix C.

Aircraft passengers and crew

Passengers

At a minimum, all aircraft passengers who were seated in the same row or two rows in front or behind a confirmed case during the case's infectious period are considered primary close contacts. If the confirmed case was infected with a more transmissible SARS-CoV-2 variant of concern, PHUs should classify all passengers on board the flight as primary close contacts. Similar criteria can be used for people who have had close contact on bus or train trips.

Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport.

Risk assessment and management of aircrew

For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify which crew members should be considered primary close contacts. Refer to Appendix D and Appendix E for further information.

Testing and quarantine of aircrew

Aircrew flying on international flights are required to be tested on arrival or undergo a COVID-19 test in Australia every 7 days, as directed by individual jurisdictions.

International aircrew arriving into Australia, who are not Australian-based (i.e. local residents), need to quarantine in a dedicated quarantine facility either between international flights or for 14 days, whichever is the shortest. Aircrew who are local residents and who enter Australia in their state of residence may be allowed to quarantine at home for 14 days or until their next international flight. For more information, see *AHPPC statement on safe air travel – enhancing end-to-end mitigations – international*.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who may be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any health care setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

7. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

8. Special situations

Use of COVID-19 vaccination in outbreak situations

During COVID-19 outbreaks[1], targeted vaccination of identified, unvaccinated individuals at risk of exposure may supplement existing public health interventions. Examples of groups where targeted vaccination may occur include: individuals in closed populations, population groups with low vaccine coverage, or groups that are at higher risk of severe outcomes.

COVID-19 vaccination may be used for two purposes in the context of an outbreak:

1. As an outbreak management strategy to reduce the number and severity of COVID-19 cases associated with an outbreak, where there is likely to be an ongoing risk of exposure.
2. To opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

COVID-19 vaccination in outbreak management

There is no evidence to support the use of COVID-19 vaccination in first generation close contacts for the purpose of post-exposure prophylaxis. It takes around 14 days for a protective effect to be seen following the first dose of both the Pfizer and AstraZeneca vaccines (62). Vaccination as an outbreak response tool is likely to be of highest utility in closed settings and where there is an ongoing risk of exposure which may cause multiple chains of transmission, such as residential aged care facilities or correctional facilities. In this context, vaccination may be considered for unvaccinated individuals with the goals of:

- Direct protection against severe outcomes and death among those who receive vaccination.
- Limiting outbreak size and duration by reducing the risk of onward transmission, and thereby reducing morbidity/mortality/demand on clinical and public health resources.

Decision-making around the use of COVID-19 vaccines during outbreaks should consider the following key principles:

- The location, outbreak context, local epidemiology and likelihood of ongoing risk of exposure (beyond 14 days following vaccination) must be considered in the development of an outbreak vaccination strategy.
- The target population for vaccination should be clearly defined.
- Where there is constrained vaccine supply, priority should be given to those:
    - who have not yet received a first dose of vaccine.
    - at risk of severe outcomes or in whom non-pharmaceutical interventions are not possible (such as those unable to physically distance).
    - at highest risk of transmission of SARS-CoV-2.
- Evaluation should be undertaken after the conclusion of the outbreak.

Opportunistic vaccination

In geographic areas where an outbreak is occurring, opportunistic vaccination of eligible groups may be used to improve vaccination coverage in the population. An outbreak presents an opportunity to promote the benefits of COVID-19 vaccination to the broader community.

Note:

1 For the purposes of vaccination during outbreaks, an outbreak is defined as a single confirmed case of COVID-19 in the community. Individual jurisdictions' outbreak definitions may differ

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All international travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Organ donation and transplantation

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for

SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix F.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and health care workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances where all alternative surge workforce strategies are exhausted and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (63). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers (see Appendix C).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Outbreak investigation and management

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Guidance on the management of aircrew

Appendix F: Organ donation and transplantation

Appendix G: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
- infection control measures being used in caring for the case, and
- home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all primary close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to High-risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHU should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHU are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHU should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHU should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of primary close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be primary close contacts. These include, staff, residents (if relevant) and visitors.

PHU may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHU should ensure all primary close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHU may also require secondary close contacts or casual contacts to quarantine.

I. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

I. Assess and record vaccination status

During outbreak investigations, it is important PHU assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities*. While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.

Detailed information on environmental cleaning and disinfection in health and residential care settings is in the *COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet*. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a) With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b) In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c) Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort on Retest Day/s**
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHU should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix C: Work Permissions and Restrictions Framework for Workers in Health Care Settings

This framework supports safe decision making when determining whether to place work permissions/restrictions, independent of quarantine, on a worker after a COVID-19 exposure in a health care setting in the context of an outbreak and community transmission of COVID-19.

Workers in health care settings include a broad array of workers including public, private, and primary care health settings. This includes workers in:

- Public health settings (e.g. public hospitals, public health clinics, ambulance services, and patient transport services)
- Private health settings (e.g. private hospital, day procedure centre or specialist outpatient services)
- Private provider facilities (e.g. general practitioners, private nurse offices, community pharmacies, consulting offices)
- Education settings in which health care students are managed to undertake placement, registration and/or internships in clinical settings

This also includes disability care workers and residential care workers, and associated students within these settings.

Health care services should apply a broad hierarchy of control framework to minimise and manage the risk of transmission of COVID-19. A system-based risk managed approach that applies appropriate mitigations reduces the risk of exposure in health care settings. However, it is acknowledged that risk cannot be eliminated and that exposures will occur.

Health services, supported by the local PHU, are responsible for considering when work permissions and restrictions are required. Health Services and Jurisdictional Departments of Health are also responsible for operationalising these guidelines including defining the reporting and escalation requirements (e.g., if multiple health services are involved) internally.

Work permissions and restrictions framework (the Framework)

The Framework provides a process and tools to support exposure assessment, work restriction and return to work decision making for workers in health care settings. The Framework is designed for workers in health care settings who have had an individual risk assessment completed after exposure to suspect or known COVID-19 case within a health care setting.

Health care managers are encouraged to be familiar with the Framework and additional jurisdictional requirements. Where possible, identify appropriate contacts to be involved in assessment teams in advance and consider training in relation to the Framework. Consider locally applying a process of monitoring and evaluation, in line with jurisdictional requirements.

The Framework includes three steps:

1. Undertake an individual risk assessment for workers in health care settings after potential exposure to a suspect or known COVID-19 case within the health care setting.

- Assessment is conducted by appropriately trained and skilled local teams from health service providers and residential care facilities (including disability services) in collaboration with the public health unit (PHU) and other specialties where available and required (e.g. Infection Prevention and Control (IPC) Units, Work Health and Safety Units, Infectious Diseases Physicians).
- Consultation should include hospital and health service operational managers, where relevant, to provide guidance on staff dynamics, workplace layouts, staffing pressure and other factors as required
- Tools to assist the assessment at this stage are available at:
  - Table 1 – Workers in health care settings exposure risk matrix for workers who are fully vaccinated for COVID-19
  - Table 2 – Workers in health care settings exposure risk matrix for workers who are unvaccinated or partially vaccinated for COVID-19
  - Table 3 – Personal Protective Equipment (PPE) breach risk assessment and actions

2. Determine the potential impacts of work restrictions on the safe ongoing management of the health service.
3. Once exposure risk is determined in the context of the facility and work impacts, refer to the recommended work permissions and mitigations action matrix.
   - Tools to assist the assessment at this stage are available at:
     - Table 4 – Recommended work restrictions and permissions as determined by risk.

Once these steps have been completed, the health service should work with the worker and supervisor to implement appropriate actions. These actions should be in line with public health policy and directives from the Chief Health Officer. Where final actions deviate from the recommended work restrictions and permissions (Table 4), this must be approved by the relevant delegate or Chief Health Officer.

Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review a worker in a health care setting's work restrictions and permissions to facilitate continuation of essential health services.

STEP 1: Undertake an individual risk assessment of affected workers in health care settings and determine level of exposure

Factors to be considered when undertaking an individual risk assessment are:

Details of exposure event (type, dose, time):

- Case details (infectious period, transmission risk, behaviour's, vaccination status, information on viral load (CT values) if available)
- Type of exposure: types of care or potential behaviours that increase the risk of COVID-19 transmission
- Details of related transmission events in the outbreak

- Amount of cumulative time the worker has occupied the same shared space as the case including type and proximity
- Vaccination status: unvaccinated, partially vaccinated, fully vaccinated
- Staff mobility: Work across multiple facilities highly mobile within the facility, work in high-risk area.

Details of mitigations in place:

- Vaccination status of the worker (unvaccinated/ partially vaccinated/ fully vaccinated)
- PPE and IPC: correct use of appropriate PPE and IPC precautions by the case and worker

Risk assessments should be made on a case-by-case basis by local health service staff in consultation with the PHU and other relevant staff. In most circumstances, exposure risk should be determined using the appropriate health care worker exposure matrix based on vaccination status (Table 1 for fully vaccinated OR Table 2 for partial or unvaccinated).

In some circumstances, the exposure matrices provide an option of moderate or high risk, to reflect that a qualitative assessment is required to determine the appropriate level of exposure. In other circumstances, the matrix provides a clear indication of the exposure risk, however this remains subject to a case-by-case assessment. For example, in circumstances where the worker in a health care setting is immune-compromised, it may be necessary to increase the risk profile (e.g., a fully vaccinated worker may be assessed using the unvaccinated risk matrix).

Final decisions should be informed by a qualitative assessment considering variety of factors, as outlined in Steps 2 and 3. Once a risk assessment, based on the above considerations, has been conducted, it is important to characterise the situational context of the exposure to help understand the impact of a potential transmission event and whether situational factors may further mitigate or increase the level of exposure and associated risk.

Factors to consider when characterising the situational context:

- Type of work location, role, and environment (e.g., use of shared equipment, shared/communal spaces, high risk setting/persons, whether indoors or outdoors, level of vaccination coverage of workers in a health care setting)
- Other workplace mitigations in place during time of potential exposure (physical barriers, negative pressure rooms, ventilation characteristics in the relevant rooms/spaces and additional HEPA air filtration)
- Vulnerability of population (workers in health care setting and patients)
- Additional controls and residual risk of transmission in the setting (e.g. daily testing programs).

Based on these situational factors, the assessment team should consider whether the exposure risk should be amended and the worker's level of exposure risk reclassified. This will inform the final individual risk assessment, prior to moving to Step 2.

STEP 2: Assess the impacts of the work restrictions

Health services and their IPC staff, with support of PHUs, are responsible for operationalising and tailoring this guidance. This may involve consultation with other specialties where

available, such as Work Health and Safety units and Infectious Diseases Specialists. While this framework cannot capture all the nuance and influential factors that may arise, the framework notes that there will be circumstances in which it is not possible to apply the recommended work permissions and restrictions as determined by the level of risk (outlined in Step 3).

In determining the final work restrictions and permissions for a staff member, the impact of these restrictions on the health services must be assessed. For example:

- If the majority or all staff in a highly specialised area are exposed
- If in a rural or regional setting where only a few staff members possess specialised skills
- If the health care service has a significant caseload without additional staff to engage.

In the first instance, health services should consider whether staff furlough can be compensated through rostering arrangements. Where possible, staff members requiring quarantine or furlough should be removed from the roster or replaced for their furlough/quarantine period.

Where this would significantly impact on the ongoing safe delivery of services, alternative rostering arrangements should be considered. This may involve:

- Redeployment of staff (e.g., accessing staff from other areas of a facility or bringing staff in from other facilities to fill roster gaps)
- Reducing hours of service operation if this can be managed whilst safely providing essential services
- Diverting patients to another facility, where this can be safely managed without overwhelming other essential health services
- Reducing the scope of service provision to only provide the highest priority care (e.g., delaying non-critical services)

Where these actions are not possible or would result in a significant disruption of essential services, it may be necessary to implement alternative mitigations so that staff members may continue working and providing essential services (see Step 3). In these circumstances, if the workforce impact is considered critical, health care services should work with the Public Health Unit to ensure their unique circumstances are considered and that appropriate mitigations are implemented (see Step 3).

STEP 3: Once exposure risk is determined, refer to the recommended work permissions and restrictions action matrix

After undertaking an individual risk assessment (Step 1) and considering impacts of work restrictions (Step 2), the assessment team should allocate a ‘risk assessment outcome’ to the worker (low, low to moderate, moderate or high). Based on the risk assessment outcome, the assessment team should consider the recommended work permission and restrictions, taking into account the impacts of these restrictions for the health care setting.

Where a worker is assessed as moderate or high risk, the Public Health Unit may recommend they undertake a period of quarantine. Where possible, workers who are advised to quarantine should complete the required quarantine period and should not attend work whilst in

quarantine. However, noting that this may not be possible due to work requirements (as identified in Step 2), it may be necessary to implement mitigations so that workers may continue to work or have a reduced quarantine period.

In some circumstances, these arrangements may result in a worker who is in quarantine due to being a close contact being able to work (pending results of PCR testing) prior to being released from quarantine. This may be necessary due to substantial workforce impacts associated with the worker needing to quarantine. Workers should adhere to the guidance of the Public Health Unit. In some cases, this may involve attending work with appropriate mitigations, however being restricted from movements within the community.

The minimum recommended work permissions and restrictions for workers based on their risk assessment outcomes are outlined in Table 3. Final work permissions and restrictions should be determined in a case-by-case basis, in line with jurisdictional requirements. Additional mitigations may include:

- Daily or more regular screening requirements
- Daily testing requirements
- Additional PPE requirements
- Minimising risk of exposure to vulnerable people
- Adjusting staff rosters to minimise risk to patients and/or exposure of other staff (e.g., exposed workers tending to COVID-19 cases)

In determining the recommended work permissions and restrictions, the assessment team should also consider the work environment and individual circumstances of the worker. Adjustments to work permissions and restrictions may be required, and in some circumstances, this may involve adjusting the minimum requirements as outlined in Table 3. For example, in regional settings it may not be feasible to require daily saliva testing (recommended for high risk). In these circumstances, the assessment team may consider removing this requirement or implementing alternative arrangements.

Where the final recommended work permissions and restrictions deviate from the recommended minimum requirements (Table 4), this must be approved by the relevant delegate or Chief Health Officer. Decisions regarding the recommended work permissions and restrictions for the worker in a health care setting should be carefully documented. Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review the recommended restrictions to facilitate continuation of essential health services.

Table 1: Workers in health care settings exposure risk matrix – Fully vaccinated for COVID-19

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)		**EXPOSURE EVENT SCENARIO#**			
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.	
PPE WORN BY STAFF& CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Low to Moderate Risk	Moderate Risk	High Risk	
	Staff: Surgical mask only Case: No surgical mask	Low Risk	Low to Moderate Risk	High Risk	
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low Risk	Low to Moderate Risk	Moderate Risk Depending on risk assessment	High Risk Depending on risk assessment
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low Risk	Moderate Risk Depending on risk assessment	High risk Depending on risk assessment
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk	Low to Moderate Risk Depending on risk assessment	Moderate Risk Depending on risk assessment
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 2: Workers in health care settings exposure risk matrix – Unvaccinated or partially vaccinated for COVID-19

Note: Mandatory vaccination requirements for workers in health care settings will be set by jurisdictions.

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

	NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)	**EXPOSURE EVENT SCENARIO#**		
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.
PPE WORN BY STAFF & CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Moderate Risk	Moderate Risk	High Risk
	Staff: Surgical mask only Case: No surgical mask	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	Moderate Risk	High Risk
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low to Moderate Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Depending on risk assessment	High Risk
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Case: No mask	Low to Moderate Risk No prolonged/ cumulative/ physical contact / Moderate Risk Prolonged / cumulative/ physical contact
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 3: PPE breach risk assessment and actions

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

Determine level of exposure		Immediate actions	Actions once risk confirmed
LOW RISK BREACH	• Breaches in PPE that occur below the neck and are managed immediately (e.g., torn glove)	• Remove from situation • Remove PPE • Perform hand hygiene • Inform line manager	Follow actions for low risk as outlined in Table 4: Recommended work permissions and restrictions.
MODERATE RISK BREACH Increased risk of infection	• Incorrect use of PPE • Incorrect PPE for task • Contamination occurs during doffing (occurs above neck)	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Screening/testing • Continuous monitoring	Follow actions for moderate risk as outlined in Table 4: Recommended work permissions and restrictions.
HIGH RISK BREACH Likely risk of infection	• Exposure of mucous membranes by direct droplets from confirmed COVID positive (e.g., spitting in HCW face by confirmed COVID case) • Contamination occurs during doffing	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Closely monitor • Screen/test • Remove from immediate duties	Follow actions for high risk as outlined in Table 4: Recommended work permissions and restrictions.

Table 4: Recommended work permissions and restrictions as determined by risk

Note: This table represents minimum national recommendations, noting that adjustments may be made based the individual assessment (step 1) and consideration of impacts (step 2). Jurisdictions may implement additional requirements above these minimum national recommendations.

	RISK LEVEL			
	LOW RISK	**LOW TO MODERATE RISK**	**MODERATE RISK**	**HIGH RISK**
Work restrictions	Continue to work.	Continue to work.	Isolate until Day 2 RT-PCR test. If test result negative can return to work. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.	**Work restrictions** **Leave workplace immediately**. **Isolate** as a primary close contact **Potential to return to work early** if Day 5 test result is negative. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.
Testing	Be alert to mild symptoms, test if symptomatic	**Day 2 RT-PCR** test **Day 5 RT-PCR** test.	**Day 2 RT-PCR** test If test result negative may return to work. **Day 5 RT-PCR** test **Day 13 RT-PCR** clearance test.	**Day 2 RT-PCR** test. **Isolate**. **Day 5 RT-PCR** retest. **Isolate while result pending**. **Day 13 RT-PCR** clearance test.
	Any staff who develop symptoms must get a throat-nose swab and **isolate** until their result is known and symptoms have resolved.			
Return to work	N/A	N/A	**Work permissions. If Day 2 test is negative may return to work.** Workplace to consider need for additional surveillance testing; Daily or less frequent saliva testing.	**Work permissions. If Day 2 test and Day 5 test are negative**, may return to work at a single site, with additional surveillance testing; daily saliva tests and; **RT-PCR** retest **day 9 and 13.** Additional: - Be alert to mild symptoms - Test if symptomatic - Limit work to a single site/area.
Additional PPE Requirements on return to work?	**Wear a surgical mask at all times** in indoor spaces including staff only spaces, unless eating/ drinking.	**Wear a surgical mask at all times** in indoor spaces including staff only spaces, unless eating/ drinking. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT PCR test.**
Work across sites?	**In general, Yes**. Inform all employers of cross-site details.	**In general, Yes**. Inform all employers of cross-site details.	**No.** Consider limiting work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work in with vulnerable persons.	**No.** Limit work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work is with vulnerable persons.
	If there is an outbreak at a workplace—i.e. if there is previously demonstrated transmission—even low-risk exposures should limit work to a single site.			
	Workers in COVID Streaming Areas must follow any jurisdiction workplace directions from the Chief Health Officer.			

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are primary close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew primary close contacts. For more information on contact tracing of aircraft passengers see Close Contacts- Aircraft passengers and crew.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify primary close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a primary close contact:
    - Face-to-face contact of any duration with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as primary close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHU should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as primary close contacts.

Additional considerations for conducting a risk assessment should include:

1. **Variants of concern**
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

2. **Proximity of crew to confirmed cases**
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered primary close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. **Duration of exposure to confirmed cases**
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered primary close contacts.

4. **Size of the compartment in which the crew and confirmed case interacted**
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered primary close contacts.

5. **The number of confirmed cases of COVID-19 on board**
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. **Potential breaches of PPE**
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered primary close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered primary close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

Aircrew and passengers who are primary close contacts

If an airline becomes aware of a crew member or passenger who was a primary close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix E: Guidance on the management of aircrew.

Appendix E: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Aircrew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix F: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (64-67).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (64).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to *the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals*.

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see *PHLN guidance on laboratory testing for SARS-CoV-2).*

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix G: Full revision history of the COVID-19 SoNG

Revision history

Version	Date	Revised by	Changes
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing

Version	Date	Revised by	Changes
			management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.

Version	Date	Revised by	Changes
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.

Version	Date	Revised by	Changes
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.

Version	Date	Revised by	Changes
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
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Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 5.1

08 October 2021

Summary of revision history

For full revision history, please refer to Appendix G

Version	Date	Revised by	Changes
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations and definitions

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – public health responses should be initiated as soon as possible.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status. All newly confirmed cases should undergo whole genome sequencing.

Confirmed cases who are hospitalised should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of patients with confirmed or suspected COVID-19, including personal protective equipment, see ICEG-endorsed infection control guidance.

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information, see Identification of potential source contacts.

Contact management

Close contacts should be managed according to management of contacts guidance.

Primary close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period, regardless of vaccination status. Primary close contacts should be actively monitored for development of fever or COVID-19 symptoms during this period, where feasible, and should be tested if symptoms develop. Primary close contacts should also be tested on entry to and (where appropriate) exit from quarantine, even if asymptomatic.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

Routine testing is required for international travellers, international aircrew, COVID-19 quarantine and isolation facility workers and primary close contacts in quarantine.

For detailed guidance on laboratory testing for SARS-COV-2, please refer to *Public Health Laboratory Network Publications*.

2. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 shares 80% sequence identity to SARS-CoV-1 (1, 2).

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (3).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (4). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (4).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings, in the context of certain behaviours, such as singing and shouting (5) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (4). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact

with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (6, 7). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (8).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of SARS-CoV-2 range from 2–4 (9). R_0 for confined settings may be at the higher end of this range. Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (10, 11).

SARS-CoV-2 variants of concern or interest

All viruses, including SARS-CoV-2, change over time. Most mutations won't significantly alter the behaviour of the virus. However occasionally, changes may provide either a biological advantage or disadvantage to virus propagation (12).

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (13, 14). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information please see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

Some SARS-CoV-2 VOC have demonstrated the potential for escape from immune recognition. In vitro studies of some variants with the E484K mutation have shown evasion of neutralising antibodies in convalescent sera of individuals previously infected with non-variant SARS-CoV-2. Further studies are required to understand the impact of VOC on the risk of re-infection and vaccine effectiveness (15, 16).

The Communicable Diseases Genomics Network is actively monitoring variants and their reported mutations to understand how these may influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see Infection Control Expert Group (ICEG) endorsed infection control guidance.

Incubation period

The majority of people become symptomatic 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (17-19). Around 1% of COVID-19 cases will develop symptoms more than 14 days after exposure (20). The advice in this guideline uses an upper range of 14 days to guide public health measures such as quarantine and isolation. There is currently insufficient high-quality evidence to determine how the incubation period for emerging variants of concern may differ from other lineages.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (21, 22). Pre-symptomatic transmission can occur 1-3 days before symptom onset (23, 24). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (25).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (22). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (25). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (26).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the public health unit (PHU). Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (27-29). Other symptoms include headache, sore throat, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (1, 27-29). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (30).

The clinical presentation of COVID-19 differs from influenza, as the former typically presents with fever, then cough followed by myalgia, headache, and sore throat while the latter more commonly initiates with cough (31).

Recent studies have reported the clinical characteristics of patients with COVID-19. Severe or fatal outcomes occur more frequently in the elderly and those with comorbid conditions (32, 33). Older adults are at increased risk of severe disease compared with younger individuals due to age-related vulnerabilities (34, 35). While those with comorbid conditions have a higher incidence of severe or fatal outcomes, there are few studies investigating the relationship between severity and mortality of COVID-19 in the context of comorbidities (33).

COVID-19 is generally a mild disease in children, with the risk of severe disease being almost 25 times greater in adults (36, 37). A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (38).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. Some individuals remain asymptomatic throughout infection.

Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (21, 22, 39-42).

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (43). Reported long-term symptoms, include fatigue, headache, attention disorder, mood changes, chest pain, palpitations, hair loss, and dyspnoea (43, 44). Fatigue is the most common long-term symptom affecting around 58% of individuals (43). For individuals who experience loss of smell and/or taste as a result of COVID-19, most regain these senses within the first 28 days following infection but up to a quarter experience longer-lasting dysfunction (45). Long-term symptoms following COVID-19 are more likely with increasing age, body mass index and female sex (46).

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.0% (47). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems on patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is 1.2% (based on surveillance data notified in Australia as of 05 October 2021). As of 05 October 2021, 54% (735/1357) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (48).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (48). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (15, 48).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (15). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (15). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Vaccination

The SARS-CoV-2 vaccination program commenced in Australia on 22 February 2021. The Therapeutic Goods Administration has approved AstraZeneca (Vaxzevria) ChAdOx1-S and Pfizer Australia - COMIRNATY BNT162b2 (mRNA) vaccines for distribution within Australia. Currently available evidence demonstrates that both AstraZeneca and Pfizer vaccines are effective in reducing the incidence and severity of COVID-19 (49).

It is not yet clear how widespread vaccination will affect the risk of SARS-CoV-2 transmission. Additionally, evidence is still emerging on vaccine effectiveness, including effectiveness following first and second doses (50).

The Australian Technical Advisory Group on Immunisation (ATAGI) has noted evidence of a rare but serious side effect involving thrombosis (clotting) with thrombocytopenia (low blood platelet count) following receipt of the AstraZeneca vaccine. ATAGI recommends the Pfizer vaccine as the preferred vaccine for adults aged under 50 years. For more information, see *ATAGI statement on AstraZeneca vaccine in response to new vaccine safety concerns*.

The safety and effectiveness of COVID-19 vaccination programs in Australia and overseas is being monitored closely in the context of how vaccination may impact upon the optimal public health management of COVID-19.

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including multiple exposure points, staff who may have a perceived need to continue work despite being unwell, and language barriers for people from culturally and linguistically diverse backgrounds. Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)

- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

Disease occurrence and public health significance

Cases of COVID-19 were initially thought to be associated with attendance at an animal wet market—located in Wuhan, Hubei Province, China—indicating a probable zoonotic source. Human-to-human transmission of SARS-CoV-2 is well established. As of 05 October 2021, numerous countries and all regions across the globe have reported broader community transmission, and globally there have been over 235.2 million confirmed cases and over 4.8 million deaths (47).

The World Health Organization (WHO) declared the outbreak of COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (51), and declared a pandemic on 12 March 2020 (52).

Australia implemented measures aimed at slowing the spread of COVID-19 into and within the country, and prepared health care services and laboratories for a targeted response. The *Australian Health Sector Emergency Response Plan for Novel Coronavirus (COVID-19)* details the national approach, the operational plan and guidance for the health sector response.

'Human coronavirus with pandemic potential' was added to the *Biosecurity (Listed Human Diseases) Determination 2016* as a listed human disease on 21 January 2020, and has been listed temporarily on the National Notifiable Diseases List (NNDL) since 10 February 2020.

On 18 March 2020, the Governor-General declared a "human biosecurity emergency" under the *Biosecurity Act 2015*, given the threat COVID-19 poses to human health on a nationally significant scale and the need to control its entry, emergence, establishment and spread in Australia. The declaration was recommended by the Minister for Health and informed by specialist medical and epidemiological advice provided by the Chief Medical Officer (in his capacity as the Director of Human Biosecurity) and the AHPPC. The human biosecurity emergency declaration gives the Minister for Health powers under the Act to determine emergency requirements or issue directions to respond to COVID-19, such as restrictions on cruise ships and overseas travel. The emergency period is regularly reviewed to ensure it remains necessary and proportionate.

States and Territories have also exercised emergency powers under jurisdictional legislation as required throughout the pandemic to manage the spread of COVID-19 as quickly and flexibly as possible.

3. Routine prevention activities

Travel

The Australian government has implemented travel restrictions and quarantine requirements to reduce transmission between countries.

All incoming international travellers must provide proof of negative COVID-19 PCR result prior to their departure to Australia. This test must be conducted 72 hours or less prior to the scheduled departure time of their flight. See *COVID-19 FAQs- international travellers to Australia*.

Jurisdictions will also conduct testing in COVID-19 quarantine and isolation facilities, for more information see Testing section.

At present, overseas travel from Australia is restricted, with few exceptions. Travellers to other countries should comply with local requirements regarding quarantine, physical distancing and the use of PPE. They should also avoid contact with sick people and maintain good personal hygiene.

Some Australian jurisdictions may implement border closures and localised movement restrictions based on changes in local epidemiology of COVID-19.

Personal hygiene

Individuals should establish and maintain good hygiene practices to prevent infection from SARS-CoV-2, which includes:

- Practising effective hand hygiene and respiratory hygiene;
- Cleaning frequently touched surfaces regularly with appropriate detergents and disinfectants;
- Staying home and not attending public places including work or school if unwell;
- Maintaining a distance of 1.5 m from people when in public; and
- Wearing a face mask in situations where physical distancing cannot be maintained.

Public communications should encourage this behaviour. Individuals who develop symptoms of COVID-19 should self-isolate and seek medical assessment.

During outbreaks or in the presence of sustained community transmission, the use of masks in the community can supplement other control measures.

Physical distancing and gatherings

Physical distancing requirements may be enforced, and restrictions have been implemented, on private and public gatherings by state/territory governments. These restrictions have varied over time.

Physical distancing is an effective measure, but it is recognised that it cannot be practised in all situations. The aim is to reduce the potential for transmission. Whilst practising physical distancing, people can travel to work (including by public transport) and carry out normal duties. Physical distancing outside the workplace aims to reduce nonessential activities and includes:

- Avoiding physically greeting other people.
- Avoiding crowds and mass gatherings.

- Avoiding small gatherings in enclosed spaces, for example family celebrations.
- Attempting to keep a distance of 1.5 metres between themselves and other people where possible, for example when in public spaces.

Jurisdictions may have public health directions in place to ensure physical distancing is occurring to further support prevention of transmission, depending on the nature of the outbreak at a point in time. These physical distancing actions may range from reducing social interactions to ‘stay at home’ requirements for all except essential workers (commonly called shutdown or lockdown). Physical distancing can be enabled through density limitations of number of people allowed in a square metre. Other examples include: capped restrictions to the number of visitors allowed at a residence or outdoor gatherings; the number of people who can attend weddings, funerals or religious services; the number of people who can participate in sport and recreational activities; and number and spacing of patrons allowed at hospitality venues, events and musical activities.

If individuals are attending public gatherings or venues, they should comply with jurisdictional directions including limitations on the number of attendees. Some jurisdictions will also require venues, businesses and organisations to keep a record with contact details of all staff, patrons and contractors visiting their premises.

4. Surveillance

There are four main objectives of surveillance for COVID-19, which are to rapidly:

1. identify, isolate and manage cases.
2. identify, quarantine and provide relevant information to contacts.
3. detect and manage clusters and outbreaks, and
4. characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place,
    - describing the transmission dynamics, and
    - identifying groups at special risk of infection.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, place of residence, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be included in the initial report, with additional information being followed up within one working day.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

Initial information on confirmed and historical cases of COVID-19 should be entered onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enhanced surveillance data should be entered shortly after case follow-up.

5. Cases

Definitions

Reporting

Both confirmed cases and historical cases should be notified in the jurisdiction of diagnosis.

People who meet the confirmed or historical case criteria who have previously been diagnosed and managed overseas or in another Australian jurisdiction do not need to be re-notified. In this situation, documented evidence of diagnosis overseas or interstate must be provided to the PHU.

Confirmed case

The confirmed case definition is intended to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing[1];

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Historical case

The historical case definition is intended to capture cases who have been infected sometime in the past that have not been previously reported and are not considered infectious at the time of diagnosis. Further laboratory testing is required to meet this criterion.

A historical case requires:

i. Laboratory evidence to support a historic infection; **AND**

ii. Absence of clinical evidence in the 14 days prior to swab date of positive test

Laboratory evidence of historic infection:

1. For people who have not been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3]; **AND**
    - A subsequent PCR is negative OR suggestive of a historical infection[3], taken at least 24 hours apart; **AND**
    - Detection of IgG or total antibody[2];

OR

2. For people who have been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[3]; **AND**
    - A subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence

- Fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4] ; or
- Loss of smell or loss of taste.

Suspect case

The suspect case definition is intended to identify those who may have an increased likelihood of current SARS-CoV-2 infection. Suspect cases may require specific infection prevention and control measures and public health management. Suspect cases do not need to be notified to the NNDSS.

A suspect case is a person who meets the below **clinical** and **epidemiological** criteria.

Clinical and public health judgement should be used in assessing if hospitalised patients with non-specific signs of infection and/or patients who do not meet the clinical or epidemiological criteria should be considered suspect cases.

Clinical evidence (in the past 14 days):

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[4]; or
- Loss of smell or loss of taste.

Epidemiological evidence (in the past 14 days):

- Close contact with a confirmed case (refer to Close contacts below)
- International travel, with the exception of green zone countries (e.g. New Zealand)
- Workers supporting designated COVID-19 quarantine and isolation services
- International border staff
- International air and maritime crew
- Health, aged or residential care workers and staff with potential COVID-19 patient contact
- People who have been in a setting where there is a COVID-19 case
- People who have been in areas with recent local transmission of SARS-CoV-2.

Notes:

[1] There is possibility for false negative PCR results in children, as some children may be found to mount a brisk immune response that is highly effective in restricting virus replication, resulting in a lower viral load (53). PHUs may seek serological evidence of SARS-CoV-2 immunity in symptomatic children who are repeatedly PCR negative but are known primary close contacts.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[3] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

[4] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Individuals meeting the suspect case definition should be tested for SARS-CoV-2, regardless of vaccination status.

Individuals meeting the enhanced testing criteria should be tested for SARS-CoV-2. However, if presentation for enhanced testing is within 48 hours of receiving a vaccine, in the absence of respiratory symptoms (including loss of smell), testing may not be required. See testing following a possible vaccine-related adverse event for more information.

State and territory communicable diseases units can advise on which laboratories can provide SARS-CoV-2 testing; appropriate specimen type, collection and transport; and also facilitate contact management if indicated.

To guide local approaches to testing, please refer to the *CDNA and PHLN Testing Framework for COVID-19 in Australia* (Testing Framework). The Testing Framework identifies key priority groups for targeted testing based on the likelihood of infection and the epidemiological situation. The Testing Framework also provides guidance on appropriate test types based on specific circumstances. Jurisdictions can apply this guidance according to their local context.

All jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures and guidance, see ICEG-endorsed infection control guidance.

Approach to specimen collection and testing for SARS-CoV-2

Laboratory testing for SARS-CoV-2 is important for individual patient diagnosis, and to guide infection prevention and control procedures and public health investigations. The main sample types submitted for testing are respiratory tract samples (upper and lower tract) and sera. Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) is the method of choice to detect SARS-CoV-2 during the acute illness.

Serology may be useful for diagnosis of historical COVID-19 cases, further investigation where nucleic acid testing is negative, and research purposes. However, currently no serological assays can reliably prove immunity to SARS-CoV-2 and the ability of serology to detect anti-spike antibody following vaccination for COVID-19 is unknown. The detection of anti-spike antibody cannot distinguish between natural infection and vaccination. Routine diagnostic serological testing is not recommended following COVID-19 vaccination.

Routine tests for acute pneumonia/pneumonitis should be requested where indicated and according to local protocols. This may include bacterial cultures, acute and convalescent serology, urinary antigen testing and nucleic acid tests for other respiratory pathogens.

The occurrence of viral coinfection in SARS-CoV-2 has been negligible in Australia to date. However, if SARS-CoV-2 is not detected, testing for other common respiratory viruses in a person with an acute respiratory tract infection may be clinically appropriate.

For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; or the different types of SARS-CoV-2 specific testing, please refer to *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Whole genome sequencing has become a vital part of Australia's response to the COVID-19 pandemic. State and territory public health laboratories have established pathogen genomics capacity and capability at varying levels. Refer to *PHLN guidance on laboratory testing for SARS-CoV-2* and Genome sequencing for all cases for further information.

Enhanced testing

The information in this section reflects the current national recommendations for SARS-CoV-2 testing beyond the suspect case definition. These recommendations will change over time based on a variety of factors, including current epidemiology and testing capacity. It is important to check relevant state and territory health department case definitions and criteria for who should be tested, as these will vary according to local epidemiology and circumstances.

Where no other clinical focus of infection or alternate explanation of the patient's illness is evident, testing beyond the suspect case definition should be undertaken on persons with:

- fever (≥37.5°C)[1] or history of fever (e.g. night sweats, chills); or
- loss of smell or loss of taste; or
- acute respiratory infection (e.g. cough, shortness of breath, sore throat)[2].

Notes:

[1] It is recommended that temperature is measured using a tympanic, oral or other thermometer proven to consistently and accurately represent peripheral body temperature.

[2] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement of the treating clinician should inform if testing beyond the suspect case definition may include individuals with sudden and unexplained onset of one or more of these other symptoms.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions will conduct routine testing of international travellers who are in hotel quarantine. Testing should occur on day 0–2 and then on day 12-14, preferably as late as possible, of hotel quarantine. Some jurisdictions may undertake mid-quarantine testing for

earlier identification of cases. Results must be received prior to release from quarantine. Travellers should be tested 2 to 3 days after leaving managed quarantine.

Exact arrangements for post-quarantine testing depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel. For further information, see Contact management – international travellers.

COVID-19 quarantine and isolation facility workers

All COVID-19 quarantine and isolation facility workers (e.g. health staff concierge, transport staff, police, security guards, cleaners, food and beverage etc.) are required to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

It is mandatory for all quarantine workers to receive COVID-19 vaccination. This includes anyone who works in places of high infection risk related to the international border (i.e. red zones). In line with Australia's COVID-19 vaccine national rollout phases, household and close contacts of quarantine workers are eligible for COVID-19 vaccination and should be strongly encouraged to receive it. Jurisdictions may implement additional requirements for quarantine workers. See Australian Health Protection Principal Committee (AHPPC) statement on National Principles for Managed Quarantine.

Testing in health care settings

Jurisdictions may consider requesting routine testing of staff in health care settings, in addition to other control strategies, where COVID-19 cases are treated or where there is community transmission. Periodic and comprehensive screening of staff in health care settings can assist in earlier identification of infection in health care environments.

Routine testing of staff in health care settings is recommended on a voluntary basis. However jurisdictions may determine the triggers for when routine testing is implemented and consider mandatory testing in certain high-risk situations. Jurisdictions may also determine the appropriate frequency and method for routine testing, depending on the specific circumstances.

Staff in health care settings who may be considered for routine testing may include staff who:

- directly care for COVID-19 patients
- work at COVID-19 testing sites
- provide occasional or intermittent care to COVID-19 patients (e.g. medical consulting units, pharmacists, allied health)
- work within the patient/client/resident zone for COVID-19 patients (e.g. ward clerks, cleaners, pharmacy deliveries, food delivery)
- transport a COVID-19 patient to a health care setting

- work in high risk areas of the hospital that don't have confirmed cases (e.g. staff in emergency departments)
- work in community health centres (e.g. GP led respiratory or fever clinics)

Provided they do not have COVID-19 symptoms and are not a primary close contact, staff in health care settings who undergo routine testing are not required to isolate whilst awaiting a negative result and may continue to work.

If staff are away from work for 7 days or more, they may be requested to undertake a COVID-19 test with oropharyngeal and deep nasal or nasopharyngeal swabs. E.g. Every 7 days while away until 14 days have passed since they were last at work.

Jurisdictions may also need to consider testing requirements for staff:

- working across wards or campuses
- working between hospitals/jobs
- who are inpatients or outpatients
- visiting high-risk settings such as hospitals or aged care facilities

The need for routine testing in these circumstances should be assessed case-by-case, giving consideration to the associated level of risk.

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHU should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Post testing instructions and isolation requirements for people with symptoms that may be due to COVID-19

Jurisdictions should give clear instructions on isolation requirements after COVID-19 testing. Clear information should be made available (e.g. on the jurisdictional health department website, in multiple languages). Where applicable, culturally-appropriate resources and engagement with community leaders may also be considered.

Individuals must follow all relevant post-testing instructions regardless of vaccination status.

Health care workers providing testing services should have a good understanding of their jurisdiction's isolation requirements after testing, based on written information from the jurisdiction's Communicable Diseases Unit (or equivalent). Health care workers providing testing services should clearly communicate the isolation requirements each person should follow after testing, depending on their situation.

Factors to consider

Post-testing instructions and the level of isolation required after testing should consider the following factors:

- Epidemiological context
- Whether the person is symptomatic
- Potential risk of transmission of undiagnosed COVID-19
- The public health risk of creating a barrier to testing

Post-testing instructions and isolation requirements

PHUs may divide instructions on isolation requirements after testing into two groups:

1. People with a clinically compatible illness who are not in quarantine
2. People with a clinically compatible illness who are in quarantine

1. For people with a clinically compatible illness who are not in quarantine:

- The person should stay at home until a negative test is returned AND symptoms have resolved[1].
- Whilst staying at home and waiting for a negative test, they should continue to practise respiratory and hand hygiene, and, where possible, try to stay at least 1.5 metres away from others and where this is not possible, wear a mask.
- Their household should not have visitors, but household contacts are free to come and go from the house.

Additional Instructions when there is community transmission:

- Where possible, they should try to isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- Household contacts should not attend high-risk settings (e.g. residential aged-care facilities)

2. For people with a clinically compatible illness who are in quarantine:

- The person should isolate in a single room in the household, avoid common areas and not carry out regular caring responsibilities that bring them into close contact with others.
- They must remain in quarantine for the pre-determined period as determined by the relevant PHU, regardless of negative test result.

Notes:

[1] In some situations, where the pre-test probability is very low and particularly where there is a long delay between taking a test and receiving a result, public health authorities may decide that it is permissible for individuals with complete symptom resolution to leave their homes, even when they have not yet received a negative test. In this situation, individuals may still be asked to avoid any high-risk settings (e.g. RACFs) until a negative test is received. Decisions on this advice will rest with local public health authorities who are best placed to recognise the level of local risk.

Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and have procedures in place for confirmatory testing when required. Despite this, it may not be possible for the laboratory to provide a definitive positive or negative result for all specimens tested for SARS-CoV-2.

In addition, despite the highly specific nature of the SARS-CoV-2 PCR, the low prevalence of COVID-19 in some jurisdictions and high levels of enhanced testing means the positive predictive value of the test result may be reduced, increasing the risk of a false positive result. PHUs should consider this in low prevalence settings along with the clinical and epidemiological information, especially when the case is not linked to a previous known case and has no other epidemiological risk factors (e.g. international travel or travel to a setting with increased incidence). Such an assessment is particularly important in order to avoid continuing unnecessary isolation of cases, quarantine of contacts, and strain on public health resources. When deciding on appropriate action, it is important to note that the incidence of false positive results in Australia to date has been very low, despite most testing being conducted in low prevalence populations.

Indeterminate or inconclusive PCR results

Despite most laboratories employing multiple PCR tests for the detection of SARS-CoV-2, often with several gene targets in each assay, it may not be possible to resolve initially discrepant PCR results in all instances (e.g. the laboratory PCR test results are weakly positive for only one SARS-CoV-2 specific target). Indeterminate results may be due to SARS-CoV-2 infection with very low viral loads, persistent shedding or due to non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should first contact the laboratory microbiologist to discuss the results and decide whether further testing is warranted. As for all indeterminate results, results should be considered in the context of the clinical and epidemiological circumstances to inform decisions on any required further public health action. Indeterminate results are not always false positive results and may occur, for example, with low viral loads or in historical cases. The procedures for investigation of suspected false positive PCR results (below) may be employed when determining whether the person with indeterminate PCR results is to be managed as a COVID-19 case.

Suspected false positive PCR results

False positive test results are rare but can occur for a variety of reasons. Further information on the possible sources of false positive PCR tests see *Public Health Laboratory Network Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

The usual circumstance for a positive SARS-CoV-2 PCR result to be suspected to be a false positive is when there is a lack of an epidemiological risk factor for acquisition of COVID-19, especially in the setting of asymptomatic screening. Before attributing the result as a false positive it is very important that the PHUs first contact the laboratory microbiologist to obtain more details of the PCR test results.

The laboratory microbiologist will investigate for any evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required (e.g. has retesting of the sample already been performed, has the result been confirmed using an assay with a second gene target or using a second molecular assay, either within the original testing laboratory, or by referral to a reference or another

laboratory). The laboratory may also perform molecular tests for alternate diagnoses, particularly molecular testing for other respiratory viral pathogens.

If results from the further laboratory investigations provide convincing evidence that the case is negative, the case may be considered a false positive and the laboratory will issue an amended report.

Investigation of suspected false positive PCR results

Where there is agreement that the PCR result should be queried as a possible false positive, further assessments should be conducted in close collaboration with the laboratory microbiologist and the treating clinician:

1. Ensure that all relevant public health action, including case isolation and contact tracing, continues until there is consensus (or majority decision) that the case is a false positive.
2. Thoroughly review the clinical history (including for mild/atypical symptoms; delayed development of symptoms; history of compatible illness) of the case and any potential epidemiological links. Consider the potential of the case being any of the following:
    - True asymptomatic infection
    - Pre-symptomatic infection
    - Symptomatic infection (especially mildly symptomatic infection)
    - Previous infection with persistent shedding of viral RNA
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider collection of acute and convalescent serum, where feasible, for serological testing to look for seroconversion or significant rise in SARS-CoV-2 neutralising or IgG antibody level.
5. Where feasible and at the discretion of PHU, collect and test respiratory specimens from primary close contacts of the case, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
    - Consider collecting sera of contacts to identify ‘potential source contacts’.

The results of the above investigation procedures, including the relevant laboratory information following discussion with the microbiologist, should be recorded and collated into a standard report.

During this process, if a second sample is PCR positive or there is evidence of seroconversion, the person should be classified as a confirmed case of COVID-19.

To assist with this determination and with public health actions, a case conference with experienced public health practitioners, the microbiologist and the treating clinician may be considered once the laboratory, clinical and epidemiological information from the investigation is available. In some jurisdictions, there may already be established panels for this purpose. Where there may be a degree of uncertainty or difficulty reaching an agreement as to whether the PCR is a false positive; the risks of missing a true COVID-19 case should be considered. Depending on the circumstances, it may be pertinent to consider the case as a confirmed case.

Where the outcome of the above assessment or case conference is that the PCR result can confidently be considered to be a false positive, all public health interventions can be

ceased, and the case and contacts should be made aware of the outcome. If notification has taken place and the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed or suspect cases:

Begin follow up investigation of confirmed or suspect cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Case interviews, exposure site identification and primary close contact identification should be completed within 1 day of notification of a confirmed case.

PHU staff should be available to contribute to the expert assessment of patients under investigation as possible cases on request from hospital clinicians or general practitioners.

Historical cases:

Confirmed historical cases do not need to isolate and their contacts do not need to quarantine, unless it can be determined that the case is a recent historical case that has not met release from isolation criteria. Some historical cases may also warrant further investigation to identify potential source contacts or chains of transmission. For more information see Identification of potential source contacts.

Response procedure

Genome sequencing for all cases

With the emergence of new variants of SARS-CoV-2 (54, 55), whole genome sequencing of COVID-19 cases in Australia must be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the Communicable Diseases Genomics Network (CDGN) to ensure timely reporting of genomics to AusTrakker, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by

sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

The response to a notification will normally be carried out in collaboration with the clinicians managing the case and be guided by the COVID-19 PHU checklist (Appendix A) and the state or territory COVID-19 case report form.

Regardless of who does the follow-up, PHU staff should ensure that action has been taken to:

- Isolate the case.
- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Record vaccination status including vaccine type, date and country of administration.
- Determine if the diagnosis has been discussed with the case or relevant caregiver before beginning the interview).
- Review both case and contact management.
- Commence or complete contact tracing, aiming for identified primary close contacts to be placed in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Identify the likely source of infection.

Note: If interviews with suspect cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices and be competent in using appropriate PPE.

If a case has had occupational exposure to animals, it may be appropriate to consult with animal health authorities as transmission between humans and animals has been observed (56).

PCR positive tests in asymptomatic or pre-symptomatic persons

Jurisdictional enhanced testing regimens may identify asymptomatic or pre-symptomatic PCR positive cases in the community (i.e. not in quarantine or a high-risk outbreak setting). In such circumstances, the person is considered a confirmed case and should be isolated while the following steps are taken:

1. Confirm veracity of the test in close liaison with the laboratory, if indicated depending on local epidemiology. In some cases, this may involve re-running the test on an alternative platform, retesting, or testing at a reference laboratory.
2. Thorough investigation of the case history for the past 3 months to determine if they had recent symptoms compatible with COVID-19 or an identified epidemiological link. If historical symptoms are identified, the duration of infectivity is regarded as commencing 48 hours prior to symptom onset for the purposes of contact tracing.
3. If no historical symptoms are identified, the case is considered infectious for 48 hours prior to the initial positive test for the purposes of contact tracing.

4. Regardless of whether historical symptoms are identified, the case should be followed prospectively for 10 days after the initial test to determine if symptoms develop. If symptoms develop, the case is considered to have been pre-symptomatic and the case and contacts should be managed according to the time of symptom onset.

Patients identified as asymptomatic or pre-symptomatic may be released from isolation when they meet the relevant 'release from isolation' criteria (refer below).

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. Where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) should be undertaken. The aim is to identify potential unrecognised chains of transmission, and may be particularly important to identify the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing should be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. Follow-up should occur for any person who in that period had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts should be screened for possible symptoms, have their temperature measured and, where feasible, be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing should be considered for potential source contacts who are currently well (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive, via PCR or a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case,

a secondary case infected by the first reported case, or represent a separate transmission chain.

Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. Further advice on clinical management is available from:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Education

Cases should be educated about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Personal protective equipment

To minimise the risk of transmission from hospitalised COVID-19 patients, PHU should encourage hospitals to undertake a system based risk assessment. Risk can be managed by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Confirmed cases who are hospitalised should be isolated in a negative pressure room with anteroom, where available. If a negative pressure room is not available, a standard isolation room or single room with negative airflow can be used. Avoid rooms with positive pressure airflow. Where there is concern about the appropriateness of the room used, PHU may undertake risk assessment to determine whether staff, visitors and other patients, should be considered close or casual contacts.

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital (see above), at home, or other community settings identified by the PHU. Cases may be managed at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- If it can be assured that the home environment permits separation of the case from other household members; the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- There is a reasonable level of confidence of the compliance of the case.

If a case is identified through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. See Release from isolation for further information.

PHUs should undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and a high index of suspicion remains that such cases may have COVID-19, consideration should be given to continued isolation and use of the recommended infection prevention and control precautions, pending further testing (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*) and re-assessment. Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. Suspect cases who are primary close contacts or are required to quarantine for other purposes (e.g. international travel) must continue to quarantine for the remainder of the 14-day period, regardless of any negative.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another pathogen.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, testing for other respiratory pathogens should be performed.

The following criteria can be used to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.

3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHU and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms that do not report Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Release from isolation criteria for all confirmed cases who do not meet historical infection criteria

Note: Revisions to the release from isolation criteria have been made due to the significant increase in number of cases infected with SARS-CoV-2 variants of concern in Australia.

The following information details the circumstances under which all confirmed cases can be released from isolation. This includes confirmed cases infected with a SARS-CoV-2 variant of concern.

Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2, or 3 – whichever is applicable.

Significantly immunocompromised cases will also need to meet additional criterion in point 4 in order to be released from isolation.

Where all clinical criteria are met for points 1 or 2 below, some cases may be eligible for early release from isolation after day 10 from symptom onset if:

- PCR is negative; or
- detection of SARS-CoV-2 specific IgG or total antibodies on serology, in the absence of vaccination.

1. Confirmed cases who have remained asymptomatic

The case can be released from isolation if at least 14 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken and no symptoms have developed during this period.

2. Confirmed cases with resolution of fever and acute respiratory symptoms

The case can be released from isolation if they meet all of the following criteria:

- at least 14 days have passed since the onset of symptoms; and
- there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]

3. Confirmed cases without complete resolution of fever and acute respiratory symptoms

The case can be released from isolation if they meet **both** of the following criteria:

- at least 20 days have passed since the onset of symptoms; and
- the case is not significantly immunocompromised[3]

OR

The case can also be released from isolation if they meet **all** the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
- the case has had two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 10 from symptom onset.

4. Significantly immunocompromised persons

In addition to meeting the appropriate criteria described in points 1 or 2 above, persons who are significantly immunocompromised[3] and are identified as confirmed cases must meet a higher standard requiring additional assessment.

They can be released from isolation when they meet the following additional criterion:

- PCR negative[2] on at least two consecutive respiratory specimens collected at least 24 hours apart after day 7 from symptom onset[4].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). This should be discussed with the treating medical practitioner, the testing laboratory and public health unit.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Testing post-release from isolation

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case has not re-developed COVID-19 symptoms but is swabbed and tests positive after they have met the above release from isolation criteria, then the case does not require re-isolation. Current evidence and Australian public health experience indicates these people are unlikely to be infectious.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness consistent with a historic infection, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Release from isolation and high-risk settings

Based on a review of available evidence, persons who fulfil the appropriate criteria above are not considered to be infectious, including those infected with a variant of concern (57-61). Cases returning to a high-risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

Note: Hospitalised patients who are being transferred to another ward or hospital, should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a nonCOVID-19 related condition.

Release from isolation and re-exposure

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a primary close contact of a confirmed case and the re-exposure was less than 6 months since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic).

Recovered cases, unless immunocompromised, can continue to attend high-risk settings and do not need to be furloughed from work if re-exposed during this 6 month period.

For recovered cases re-exposed after 6 months from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist and/or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be re-tested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Release from isolation and gastrointestinal symptoms

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. For cases who do have faecal samples tested and remain persistently PCR positive in these samples after all release from isolation criteria are met, further or extended precautions and exclusions should be implemented on a case-by-case basis:

- All cases with diarrhoea should be advised against preparing food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. health care workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. It is recommended that people who remain persistently PCR positive in faecal samples use soap and water for hand hygiene. If this is unavailable, alcohol hand gel should be used.

Education emphasising the importance of proper hand hygiene should be provided to all cases upon release from isolation.

Definition of COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

6. Contacts

Close contact definitions

The aim of contact tracing is to interrupt transmission of SARS-CoV-2. The following definitions of contacts should be used to rapidly identify all persons who may be incubating the disease.

Primary close contact

A primary close contact is defined as a person who has:

- had face-to-face contact with a confirmed case during their infectious period; or
- shared a closed space with a confirmed case during their infectious period, where there is reasonable risk of transmission based on a risk assessment performed by the PHU, taking into account:
    - transmission having been proven to have readily occurred in this (or a similar) setting;
    - the specific variant of SARS-CoV-2;
    - the adequacy of air exchange in an indoor environment; or
    - the nature of the exposure (e.g. type of contact, mask use, whether shouting or singing, size of venue etc.).

If the case is asymptomatic, see PCR positive tests in asymptomatic or pre-symptomatic persons for information on determining the infectious period to inform identification of contacts.

Note that:

- The infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered, at the discretion of the PHU.
- Health care workers and other contacts who have taken recommended infection control precautions, including the use of appropriate PPE, while caring for an infectious confirmed COVID-19 case are not generally considered to be primary close contacts, provided that appropriate PPE has been worn and there has not been a PPE breach.

Casual contact

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a primary close contact.

At the discretion of the PHU, some casual contacts may be reclassified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to individuals who do not meet the primary close contact definition.

The following factors should be considered prior to reclassifying casual contacts as primary close contacts:

- Epidemiological context, including level of community transmission.
- The specific variant of SARS-CoV-2.
- The potential for large scale amplification in the given setting or venue
- Jurisdictional capacity and resourcing requirements, including opportunity costs of managing them as close contacts
- Feasibility and resulting impacts of public health measures on essential services (e.g. provision of health care services)
- Vulnerability of the contacts.

Depending on the above factors, public health units may implement a range of options for management of casual contacts in different settings. See Management of contacts- casual contacts for further information.

Secondary close contact

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact or shared a closed space in any setting with a primary close contact of a COVID-19 case, from 24 hours after the primary contact's exposure to the case.

Identification of secondary close contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Management of contacts

All persons identified as having had contact with a confirmed case should be assessed to see if they should be classified as a primary close contact and should have demographic and epidemiological data collected.

All identified contacts who do not meet the primary close contact definition should be provided with information on their risk (refer to Education below), where feasible.

Quarantine and restriction

The site of quarantine needs to be carefully chosen to prevent transmission to others. Homes may not be feasible if the person cannot quarantine away from other house members.

Primary close contacts

PHU should advise primary close contacts to:

- Quarantine for 14 days following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- Monitor their health. PHUs should conduct active daily monitoring of primary close contacts for COVID-19 symptoms for 14 days after the last possible contact with a confirmed COVID-19 case. This may include daily contact via SMS.
- Get tested during the quarantine period (see below).

Primary close contacts must be advised on the processes for seeking medical care, including how to safely seek COVID-19 testing if they develop symptoms. Refer to Medical care for quarantined individuals.

At a minimum, testing of primary close contacts should occur:

1. If COVID-19 symptoms develop
2. On entry to quarantine
    - A positive test result would make the primary close contact a case and support an earlier decision to move the person to an alternative place for isolation and bring forward contact tracing for that person.
3. Before exit from quarantine
    - A positive test result late in the quarantine period (e.g. day 10–13), prevents the release of potentially infectious people into the community.
    - In some circumstances, PHU may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.
4. Mid-quarantine (where appropriate)
    - If there is reason to doubt compliance with quarantine or high risk of the primary close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Casual contacts

Depending on the circumstances, PHU may consider the following options for management of casual contacts in the community[1]:

Unvaccinated or partially vaccinated casual contacts	Fully vaccinated casual contacts[2,3]
1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events) • At a minimum, unvaccinated or partially vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required.	**1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events)** • At a minimum, fully vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required.
2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools) • Unvaccinated or partially vaccinated casual contacts may be requested to enter into quarantine, depending on the local epidemiology. If quarantine is indicated, a shorter	**2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • In contexts with established community transmission, fully vaccinated casual contacts do not need to quarantine.

term quarantine until around 5 days after exposure is appropriate. • They should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • If quarantined, the unvaccinated casual contact may exit quarantine once a negative day 4-6 PCR result is returned. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.	• They should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house. • Jurisdictions with no community transmission may implement more conservative approaches.

Note:

1. For guidance on management of casual contacts who are workers in healthcare settings, please see Appendix C.
2. Fully vaccinated refers to a person who is:
    a. ≥2 weeks following receipt of the second dose in a 2-dose series; and
    b. has evidence of full vaccination on the Australian Immunisation Register (AIR)
3. By PHU discretion, some individuals who were vaccinated overseas may be considered fully vaccinated. In this situation, documented evidence of overseas vaccination history must be provided to the PHU.

Secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHU may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. lives with the case, exposed at a high-risk setting where transmission has already occurred);
- The secondary close contact is unable to remain isolated from the primary close contact (e.g. one is a carer for the other or lives in the same household);
- There will be a delay in confirming the initial case or commencement of contact tracing (enabling more time for the primary close contact to become infectious prior to quarantine);
- Secondary transmission has already occurred from a primary close contact to a secondary close contact;
- There are communication challenges with close contacts; or

- The consequences of the secondary case being positive is deemed very high risk (e.g. returning to a remote community).

Secondary close contacts may be quarantined until the PHU has confirmed that the primary close contact was not infectious at the time of last contact with the secondary close contact.

Household secondary close contacts

PHU may require household secondary close contacts to quarantine until the primary close contact is cleared from quarantine.

Non-household secondary close contacts

PHU may require secondary close contacts who are in a different household to the primary close contact to remain in quarantine until 14 days from the last exposure of the primary close contact to the confirmed case.

Alternatively, PHU may require these secondary close contacts to remain in quarantine until there is confirmation that the primary close contact was not infectious at the last time of contact with the secondary close contact (e.g. if the primary close contact tests negative).

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies may be useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or is challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix B: Outbreak investigation and management).

International travellers

International travellers are defined as those who have undertaken international travel to any country outside Australia in the last 14 days.

All international travellers, with the exception of travellers from green zone flights, who have returned from international travel are required to be in mandatory quarantine for 14 days after arrival in Australia and adhere to any additional jurisdictional quarantine requirements.

All international travellers who have undertaken international travel in the last 14 days who are unwell with fever, or with respiratory symptoms (with or without fever) or other symptoms consistent with COVID-19 should be isolated and managed as per the current recommendations for suspect cases.

Testing of international travellers

Jurisdictions will conduct routine testing of international travellers who are in a managed quarantine facility. At a minimum, testing should occur on day 0–2 and then on day 12-14, preferably as late as possible, of quarantine, with results to be received prior to release from quarantine. Some jurisdictions may undertake mid-quarantine testing for earlier identification of cases. Exact arrangements will depend on state and territory protocols. Jurisdictions may also test asymptomatic persons quarantined due to interstate travel.

If negative test results are received, the international traveller may finish quarantine after the 14-day period has transpired. If a positive result is received, the international traveller should be isolated and managed as per the recommendations for confirmed cases.

A further test is required **2 to 3 days after** leaving managed quarantine. Some jurisdictions may choose not to test post-quarantine for extremely low risk cohorts. This measure is aimed at reducing the limited but real risk of community transmission in the unlikely circumstance that an international traveller acquired COVID-19 while in quarantine. In addition, this measure may also detect cases with an unusually long incubation period (longer than the routine 14 days). See AHPPC statement on testing travellers once they leave managed quarantine.

Provided the traveller has no COVID-19 symptoms after leaving managed quarantine, further isolation is not required from the time of leaving the quarantine facility through to receiving a negative result on the post-quarantine test. However, if the traveller develops COVID-19 symptoms within 14 days after leaving managed quarantine, they must arrange to have a COVID-19 test as soon as possible and isolate until a negative result is received. Quarantine programs should provide international travellers with information alerting them to these requirements.

Health and residential care workers

For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, please see Appendix C.

Aircraft passengers and crew

Passengers

At a minimum, all aircraft passengers who were seated in the same row or two rows in front or behind a confirmed case during the case's infectious period are considered primary close contacts. If the confirmed case was infected with a more transmissible SARS-CoV-2 variant of concern, PHUs should classify all passengers on board the flight as primary close

contacts. Similar criteria can be used for people who have had close contact on bus or train trips.

Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport.

Risk assessment and management of aircrew

For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify which crew members should be considered primary close contacts. Refer to Appendix D and Appendix E for further information.

Testing and quarantine of aircrew

Aircrew flying on international flights are required to be tested on arrival or undergo a COVID-19 test in Australia every 7 days, as directed by individual jurisdictions.

International aircrew arriving into Australia, who are not Australian-based (i.e. local residents), need to quarantine in a dedicated quarantine facility either between international flights or for 14 days, whichever is the shortest. Aircrew who are local residents and who enter Australia in their state of residence may be allowed to quarantine at home for 14 days or until their next international flight. For more information, see *AHPPC statement on safe air travel – enhancing end-to-end mitigations – international*.

Quarantine and essential workers

Quarantined individuals who are regarded as essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, an individual risk assessment should be conducted in collaboration with the PHU to identify essential workers who may be permitted to maintain normal work patterns while in quarantine.

This should only be considered in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If normal work patterns are maintained, the essential worker should practise vigilant physical distancing, hand and respiratory hygiene, and wear a mask whilst around others at work. Normal quarantine restrictions should be adhered to outside of essential work activities.

Medical care for quarantined individuals

If individuals in quarantine need medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department before presenting. Patients with severe symptoms should call 000 and make it clear they are in quarantine or isolation (or otherwise) because of COVID-19. If the patient has symptoms consistent with the COVID-19, the local PHU should be consulted about the most suitable venue for clinical assessment and specimen collection. Where feasible, patients should don a surgical mask before presenting to any health care setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with the clinical criteria in the suspect case definition develop within the first 14 days following the last contact with a confirmed case,

the individual should be immediately isolated and managed as per the current recommendations for suspected COVID-19 cases, with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic primary close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Prophylaxis

No specific chemoprophylaxis is available for contacts.

Education

Primary and secondary close contacts (where secondary close contacts are identified and contacted) should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They are required to self-quarantine. Casual contacts are not required to quarantine, but may similarly, where feasible, be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

7. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

8. Special situations

Use of COVID-19 vaccination in outbreak situations

During COVID-19 outbreaks[1], targeted vaccination of identified, unvaccinated individuals at risk of exposure may supplement existing public health interventions. Examples of groups where targeted vaccination may occur include: individuals in closed populations, population groups with low vaccine coverage, or groups that are at higher risk of severe outcomes.

COVID-19 vaccination may be used for two purposes in the context of an outbreak:

1. As an outbreak management strategy to reduce the number and severity of COVID-19 cases associated with an outbreak, where there is likely to be an ongoing risk of exposure.
2. To opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

COVID-19 vaccination in outbreak management

There is no evidence to support the use of COVID-19 vaccination in first generation close contacts for the purpose of post-exposure prophylaxis. It takes around 14 days for a protective effect to be seen following the first dose of both the Pfizer and AstraZeneca vaccines (62). Vaccination as an outbreak response tool is likely to be of highest utility in closed settings and where there is an ongoing risk of exposure which may cause multiple chains of transmission, such as residential aged care facilities or correctional facilities. In this context, vaccination may be considered for unvaccinated individuals with the goals of:

- Direct protection against severe outcomes and death among those who receive vaccination.
- Limiting outbreak size and duration by reducing the risk of onward transmission, and thereby reducing morbidity/mortality/demand on clinical and public health resources.

Decision-making around the use of COVID-19 vaccines during outbreaks should consider the following key principles:

- The location, outbreak context, local epidemiology and likelihood of ongoing risk of exposure (beyond 14 days following vaccination) must be considered in the development of an outbreak vaccination strategy.
- The target population for vaccination should be clearly defined.
- Where there is constrained vaccine supply, priority should be given to those:
    - who have not yet received a first dose of vaccine.
    - at risk of severe outcomes or in whom non-pharmaceutical interventions are not possible (such as those unable to physically distance).
    - at highest risk of transmission of SARS-CoV-2.
- Evaluation should be undertaken after the conclusion of the outbreak.

Opportunistic vaccination

In geographic areas where an outbreak is occurring, opportunistic vaccination of eligible groups may be used to improve vaccination coverage in the population. An outbreak presents an opportunity to promote the benefits of COVID-19 vaccination to the broader community.

Note:

1 For the purposes of vaccination during outbreaks, an outbreak is defined as a single confirmed case of COVID-19 in the community. Individual jurisdictions' outbreak definitions may differ

Cruise ships

Risk assessment and identification of contacts

Cruise ships represent a high-risk setting for outbreaks of COVID-19. All persons travelling on cruise ships, regardless of whether cases of COVID-19 have occurred, should be quarantined for 14 days following disembarkation.

Hospital transfer of confirmed or suspect cases

If confirmed or suspect cases on board require transfer to a hospital, the Commonwealth Biosecurity Officer will notify the port authority to provide access for medical transport. The jurisdictional Human Biosecurity Officer will then coordinate transfer of the person to an appropriate medical facility for further management, via the most appropriate means that adheres to necessary precautions.

Quarantine for passengers and crew after arrival at a seaport

All international travellers are required to quarantine. Returned international travellers, including cruise ship passengers and crew, must adhere to jurisdictional quarantine requirements. States and territories should ensure effective quarantine of returned international travellers, which may include hotel-based quarantine. Matters of quarantine should be addressed jurisdictionally. It is important that appropriate PPE precautions are employed during any travel following disembarkation.

Disembarking and embarking

After all confirmed and suspect cases have been managed appropriately and the Human Biosecurity Officer has determined that no other passengers or crew have symptoms consistent with COVID-19, remaining passengers and crew will be allowed to disembark. The vessel may be permitted to commence embarking once it is certain there is no risk of ongoing transmission.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Organ donation and transplantation

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for

SARS-CoV-2; ideally, recipients would also be tested. For more detailed information, refer to Appendix F.

Workplaces

Where a case has physically attended work while infectious, PHUs should conduct a risk assessment of potential workplace transmission in conjunction with workplaces. This may include requesting workplaces to provide a list of all workers who have had contact with an infected worker. Resources for workplaces can be accessed at *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

Contingency capacity strategies for aged and health care workforce

Widespread COVID-19 transmission in health or aged care facilities may result in significant workforce shortages due to a large number of exposed (or potentially exposed) staff. Staff may not be able to attend work because they are confirmed cases, close contacts, or furloughed (directed not to attend work) as they have (or potentially have) had unprotected exposure to COVID-19.

In circumstances where all alternative surge workforce strategies are exhausted and return to work of furloughed staff is essential to maintaining facility operations and ensuring the safety and wellbeing of individuals (e.g. in health or aged care facilities), PHUs may be requested to assist in decision making processes to help enable exposed staff who are not confirmed cases to return to work. The decision on the requirement for staff who have been identified as having some risk of infection to return to work based on workforce requirements and resultant risk management remains with the facility decision makers.

As a last resort, PHUs could recommend a number of risk mitigation strategies (63). These recommendations should be made on a case by case basis, in addition to routine preventive protocols (e.g. symptom screening, IPC and PPE training) and, in no particular order, could include:

i. Risk assessment and stratification of workers (see Appendix C).
ii. Regular re-testing of PCR negative returned workers where feasible (e.g. 48 or 72 hourly) until 14 days after the last unprotected exposure; or until a positive result is returned (becomes a confirmed case and is required to isolate).
iii. Mandatory wearing of a surgical mask while at work until 14 days after the last unprotected exposure. Workers should change their mask throughout the day and only wear it for the maximum period recommended.
iv. Clear plans for how the worker will be managed within the facility (e.g. zoning staff to a specific wing or ward; caring for specific patients or residents, preferably people from lower risk groups; work in lower risk roles if available; and limiting staff members who can work together).
v. Clear requirements that, for 14 days from the last unprotected exposure, the worker must only work in one facility and, if a close contact, quarantine at home when not at work.

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Appendices

Appendix A: PHU checklist

Appendix B: Outbreak investigation and management

Appendix D: Risk assessment and identification of close contacts in aircrew

Appendix E: Guidance on the management of aircrew

Appendix F: Organ donation and transplantation

Appendix G: Full revision history of the COVID-19 SoNG

Appendix A: PHU checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
- infection control measures being used in caring for the case, and
- home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all primary close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to High-risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection

Consider need for media release and designate a media spokesperson.

Appendix B: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHU should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHU are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHU should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHU should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of primary close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be primary close contacts. These include, staff, residents (if relevant) and visitors.

PHU may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHU should ensure all primary close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHU may also require secondary close contacts or casual contacts to quarantine.

I. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

I. Assess and record vaccination status

During outbreak investigations, it is important PHU assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities*. While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.

Detailed information on environmental cleaning and disinfection in health and residential care settings is in the *COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet*. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a) With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b) In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c) Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort on Retest Day/s**
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHU should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix C: Work Permissions and Restrictions Framework for Workers in Health Care Settings

This framework supports safe decision making when determining whether to place work permissions/restrictions, independent of quarantine, on a worker after a COVID-19 exposure in a health care setting in the context of an outbreak and community transmission of COVID-19.

Workers in health care settings include a broad array of workers including public, private, and primary care health settings. This includes workers in:

- Public health settings (e.g. public hospitals, public health clinics, ambulance services, and patient transport services)
- Private health settings (e.g. private hospital, day procedure centre or specialist outpatient services)
- Private provider facilities (e.g. general practitioners, private nurse offices, community pharmacies, consulting offices)
- Education settings in which health care students are managed to undertake placement, registration and/or internships in clinical settings

This also includes disability care workers and residential care workers, and associated students within these settings.

Health care services should apply a broad hierarchy of control framework to minimise and manage the risk of transmission of COVID-19. A system-based risk managed approach that applies appropriate mitigations reduces the risk of exposure in health care settings. However, it is acknowledged that risk cannot be eliminated and that exposures will occur.

Health services, supported by the local PHU, are responsible for considering when work permissions and restrictions are required. Health Services and Jurisdictional Departments of Health are also responsible for operationalising these guidelines including defining the reporting and escalation requirements (e.g., if multiple health services are involved) internally.

Work permissions and restrictions framework (the Framework)

The Framework provides a process and tools to support exposure assessment, work restriction and return to work decision making for workers in health care settings. The Framework is designed for workers in health care settings who have had an individual risk assessment completed after exposure to suspect or known COVID-19 case within a health care setting.

Health care managers are encouraged to be familiar with the Framework and additional jurisdictional requirements. Where possible, identify appropriate contacts to be involved in assessment teams in advance and consider training in relation to the Framework. Consider locally applying a process of monitoring and evaluation, in line with jurisdictional requirements.

The Framework includes three steps:

1. Undertake an individual risk assessment for workers in health care settings after potential exposure to a suspect or known COVID-19 case within the health care setting.

- Assessment is conducted by appropriately trained and skilled local teams from health service providers and residential care facilities (including disability services) in collaboration with the public health unit (PHU) and other specialties where available and required (e.g. Infection Prevention and Control (IPC) Units, Work Health and Safety Units, Infectious Diseases Physicians).
- Consultation should include hospital and health service operational managers, where relevant, to provide guidance on staff dynamics, workplace layouts, staffing pressure and other factors as required
- Tools to assist the assessment at this stage are available at:
  - Table 1 – Workers in health care settings exposure risk matrix for workers who are fully vaccinated for COVID-19
  - Table 2 – Workers in health care settings exposure risk matrix for workers who are unvaccinated or partially vaccinated for COVID-19
  - Table 3 – Personal Protective Equipment (PPE) breach risk assessment and actions

2. Determine the potential impacts of work restrictions on the safe ongoing management of the health service.
3. Once exposure risk is determined in the context of the facility and work impacts, refer to the recommended work permissions and mitigations action matrix.
   - Tools to assist the assessment at this stage are available at:
     - Table 4 – Recommended work restrictions and permissions as determined by risk.

Once these steps have been completed, the health service should work with the worker and supervisor to implement appropriate actions. These actions should be in line with public health policy and directives from the Chief Health Officer. Where final actions deviate from the recommended work restrictions and permissions (Table 4), this must be approved by the relevant delegate or Chief Health Officer.

Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review a worker in a health care setting's work restrictions and permissions to facilitate continuation of essential health services.

STEP 1: Undertake an individual risk assessment of affected workers in health care settings and determine level of exposure

Factors to be considered when undertaking an individual risk assessment are:

Details of exposure event (type, dose, time):

- Case details (infectious period, transmission risk, behaviour's, vaccination status, information on viral load (CT values) if available)
- Type of exposure: types of care or potential behaviours that increase the risk of COVID-19 transmission
- Details of related transmission events in the outbreak

- Amount of cumulative time the worker has occupied the same shared space as the case including type and proximity
- Vaccination status: unvaccinated, partially vaccinated, fully vaccinated
- Staff mobility: Work across multiple facilities highly mobile within the facility, work in high-risk area.

Details of mitigations in place:

- Vaccination status of the worker (unvaccinated/ partially vaccinated/ fully vaccinated)
- PPE and IPC: correct use of appropriate PPE and IPC precautions by the case and worker

Risk assessments should be made on a case-by-case basis by local health service staff in consultation with the PHU and other relevant staff. In most circumstances, exposure risk should be determined using the appropriate health care worker exposure matrix based on vaccination status (Table 1 for fully vaccinated OR Table 2 for partial or unvaccinated).

In some circumstances, the exposure matrices provide an option of moderate or high risk, to reflect that a qualitative assessment is required to determine the appropriate level of exposure. In other circumstances, the matrix provides a clear indication of the exposure risk, however this remains subject to a case-by-case assessment. For example, in circumstances where the worker in a health care setting is immune-compromised, it may be necessary to increase the risk profile (e.g., a fully vaccinated worker may be assessed using the unvaccinated risk matrix).

Final decisions should be informed by a qualitative assessment considering variety of factors, as outlined in Steps 2 and 3. Once a risk assessment, based on the above considerations, has been conducted, it is important to characterise the situational context of the exposure to help understand the impact of a potential transmission event and whether situational factors may further mitigate or increase the level of exposure and associated risk.

Factors to consider when characterising the situational context:

- Type of work location, role, and environment (e.g., use of shared equipment, shared/communal spaces, high risk setting/persons, whether indoors or outdoors, level of vaccination coverage of workers in a health care setting)
- Other workplace mitigations in place during time of potential exposure (physical barriers, negative pressure rooms, ventilation characteristics in the relevant rooms/spaces and additional HEPA air filtration)
- Vulnerability of population (workers in health care setting and patients)
- Additional controls and residual risk of transmission in the setting (e.g. daily testing programs).

Based on these situational factors, the assessment team should consider whether the exposure risk should be amended and the worker's level of exposure risk reclassified. This will inform the final individual risk assessment, prior to moving to Step 2.

STEP 2: Assess the impacts of the work restrictions

Health services and their IPC staff, with support of PHUs, are responsible for operationalising and tailoring this guidance. This may involve consultation with other specialties where

available, such as Work Health and Safety units and Infectious Diseases Specialists. While this framework cannot capture all the nuance and influential factors that may arise, the framework notes that there will be circumstances in which it is not possible to apply the recommended work permissions and restrictions as determined by the level of risk (outlined in Step 3).

In determining the final work restrictions and permissions for a staff member, the impact of these restrictions on the health services must be assessed. For example:

- If the majority or all staff in a highly specialised area are exposed
- If in a rural or regional setting where only a few staff members possess specialised skills
- If the health care service has a significant caseload without additional staff to engage.

In the first instance, health services should consider whether staff furlough can be compensated through rostering arrangements. Where possible, staff members requiring quarantine or furlough should be removed from the roster or replaced for their furlough/quarantine period.

Where this would significantly impact on the ongoing safe delivery of services, alternative rostering arrangements should be considered. This may involve:

- Redeployment of staff (e.g., accessing staff from other areas of a facility or bringing staff in from other facilities to fill roster gaps)
- Reducing hours of service operation if this can be managed whilst safely providing essential services
- Diverting patients to another facility, where this can be safely managed without overwhelming other essential health services
- Reducing the scope of service provision to only provide the highest priority care (e.g., delaying non-critical services)

Where these actions are not possible or would result in a significant disruption of essential services, it may be necessary to implement alternative mitigations so that staff members may continue working and providing essential services (see Step 3). In these circumstances, if the workforce impact is considered critical, health care services should work with the Public Health Unit to ensure their unique circumstances are considered and that appropriate mitigations are implemented (see Step 3).

STEP 3: Once exposure risk is determined, refer to the recommended work permissions and restrictions action matrix

After undertaking an individual risk assessment (Step 1) and considering impacts of work restrictions (Step 2), the assessment team should allocate a ‘risk assessment outcome’ to the worker (low, low to moderate, moderate or high). Based on the risk assessment outcome, the assessment team should consider the recommended work permission and restrictions, taking into account the impacts of these restrictions for the health care setting.

Where a worker is assessed as moderate or high risk, the Public Health Unit may recommend they undertake a period of quarantine. Where possible, workers who are advised to quarantine should complete the required quarantine period and should not attend work whilst in

quarantine. However, noting that this may not be possible due to work requirements (as identified in Step 2), it may be necessary to implement mitigations so that workers may continue to work or have a reduced quarantine period.

In some circumstances, these arrangements may result in a worker who is in quarantine due to being a close contact being able to work (pending results of PCR testing) prior to being released from quarantine. This may be necessary due to substantial workforce impacts associated with the worker needing to quarantine. Workers should adhere to the guidance of the Public Health Unit. In some cases, this may involve attending work with appropriate mitigations, however being restricted from movements within the community.

The minimum recommended work permissions and restrictions for workers based on their risk assessment outcomes are outlined in Table 3. Final work permissions and restrictions should be determined in a case-by-case basis, in line with jurisdictional requirements. Additional mitigations may include:

- Daily or more regular screening requirements
- Daily testing requirements
- Additional PPE requirements
- Minimising risk of exposure to vulnerable people
- Adjusting staff rosters to minimise risk to patients and/or exposure of other staff (e.g., exposed workers tending to COVID-19 cases)

In determining the recommended work permissions and restrictions, the assessment team should also consider the work environment and individual circumstances of the worker. Adjustments to work permissions and restrictions may be required, and in some circumstances, this may involve adjusting the minimum requirements as outlined in Table 3. For example, in regional settings it may not be feasible to require daily saliva testing (recommended for high risk). In these circumstances, the assessment team may consider removing this requirement or implementing alternative arrangements.

Where the final recommended work permissions and restrictions deviate from the recommended minimum requirements (Table 4), this must be approved by the relevant delegate or Chief Health Officer. Decisions regarding the recommended work permissions and restrictions for the worker in a health care setting should be carefully documented. Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review the recommended restrictions to facilitate continuation of essential health services.

Table 1: Workers in health care settings exposure risk matrix – Fully vaccinated for COVID-19

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)		**EXPOSURE EVENT SCENARIO#**			
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.	
PPE WORN BY STAFF& CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Low to Moderate Risk	Moderate Risk	High Risk	
	Staff: Surgical mask only Case: No surgical mask	Low Risk	Low to Moderate Risk	High Risk	
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low Risk	Low to Moderate Risk	Moderate Risk Depending on risk assessment	High Risk Depending on risk assessment
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low Risk	Moderate Risk Depending on risk assessment	High risk Depending on risk assessment
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk	Low to Moderate Risk Depending on risk assessment	Moderate Risk Depending on risk assessment
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 2: Workers in health care settings exposure risk matrix – Unvaccinated or partially vaccinated for COVID-19

Note: Mandatory vaccination requirements for workers in health care settings will be set by jurisdictions.

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

	NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)	**EXPOSURE EVENT SCENARIO#**		
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.
PPE WORN BY STAFF & CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Moderate Risk	Moderate Risk	High Risk
	Staff: Surgical mask only Case: No surgical mask	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	Moderate Risk	High Risk
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low to Moderate Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Depending on risk assessment	High Risk
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Case: No mask	Low to Moderate Risk No prolonged/ cumulative/ physical contact / Moderate Risk Prolonged / cumulative/ physical contact
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 3: PPE breach risk assessment and actions

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

Determine level of exposure		Immediate actions	Actions once risk confirmed
LOW RISK BREACH	• Breaches in PPE that occur below the neck and are managed immediately (e.g., torn glove)	• Remove from situation • Remove PPE • Perform hand hygiene • Inform line manager	Follow actions for low risk as outlined in Table 4: Recommended work permissions and restrictions.
MODERATE RISK BREACH Increased risk of infection	• Incorrect use of PPE • Incorrect PPE for task • Contamination occurs during doffing (occurs above neck)	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Screening/testing • Continuous monitoring	Follow actions for moderate risk as outlined in Table 4: Recommended work permissions and restrictions.
HIGH RISK BREACH Likely risk of infection	• Exposure of mucous membranes by direct droplets from confirmed COVID positive (e.g., spitting in HCW face by confirmed COVID case) • Contamination occurs during doffing	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Closely monitor • Screen/test • Remove from immediate duties	Follow actions for high risk as outlined in Table 4: Recommended work permissions and restrictions.

Table 4: Recommended work permissions and restrictions as determined by risk

Note: This table represents minimum national recommendations, noting that adjustments may be made based the individual assessment (step 1) and consideration of impacts (step 2). Jurisdictions may implement additional requirements above these minimum national recommendations.

	RISK LEVEL			
	LOW RISK	**LOW TO MODERATE RISK**	**MODERATE RISK**	**HIGH RISK**
Work restrictions	Continue to work.	Continue to work.	Isolate until Day 2 RT-PCR test. If test result negative can return to work. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.	**Work restrictions** **Leave workplace immediately**. **Isolate** as a primary close contact **Potential to return to work early** if Day 5 test result is negative. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.
Testing	Be alert to mild symptoms, test if symptomatic	**Day 2 RT-PCR** test **Day 5 RT-PCR** test.	**Day 2 RT-PCR** test If test result negative may return to work. **Day 5 RT-PCR** test **Day 13 RT-PCR** clearance test.	**Day 2 RT-PCR** test. **Isolate**. **Day 5 RT-PCR** retest. **Isolate while result pending**. **Day 13 RT-PCR** clearance test.
	Any staff who develop symptoms must get a throat-nose swab and **isolate** until their result is known and symptoms have resolved.			
Return to work	N/A	N/A	**Work permissions. If Day 2 test is negative may return to work.** Workplace to consider need for additional surveillance testing; Daily or less frequent saliva testing.	**Work permissions. If Day 2 test and Day 5 test are negative**, may return to work at a single site, with additional surveillance testing; daily saliva tests and; **RT-PCR** retest **day 9 and 13.** Additional: - Be alert to mild symptoms - Test if symptomatic - Limit work to a single site/area.
Additional PPE Requirements on return to work?	**Wear a surgical mask at all times** in indoor spaces including staff only spaces, unless eating/ drinking.	**Wear a surgical mask at all times** in indoor spaces including staff only spaces, unless eating/ drinking. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT PCR test.**
Work across sites?	**In general, Yes**. Inform all employers of cross-site details.	**In general, Yes**. Inform all employers of cross-site details.	**No.** Consider limiting work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work in with vulnerable persons.	**No.** Limit work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work is with vulnerable persons.
	If there is an outbreak at a workplace—i.e. if there is previously demonstrated transmission—even low-risk exposures should limit work to a single site.			
	Workers in COVID Streaming Areas must follow any jurisdiction workplace directions from the Chief Health Officer.			

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are primary close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew primary close contacts. For more information on contact tracing of aircraft passengers see Close Contacts- Aircraft passengers and crew.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify primary close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a primary close contact:
    - Face-to-face contact of any duration with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is considered no longer infectious).
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as primary close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHU should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as primary close contacts.

Additional considerations for conducting a risk assessment should include:

1. **Variants of concern**
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

2. **Proximity of crew to confirmed cases**
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered primary close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. **Duration of exposure to confirmed cases**
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered primary close contacts.

4. **Size of the compartment in which the crew and confirmed case interacted**
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered primary close contacts.

5. **The number of confirmed cases of COVID-19 on board**
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. **Potential breaches of PPE**
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered primary close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered primary close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as primary close contacts.

Aircrew and passengers who are primary close contacts

If an airline becomes aware of a crew member or passenger who was a primary close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix E: Guidance on the management of aircrew.

Appendix E: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Aircrew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix F: Organ donation and transplantation

Testing of deceased and living donors and transplant recipients

Viral safety of donated tissue and organs remains a concern as there is significant uncertainty about viraemia during the COVID-19 incubation period; during an asymptomatic course of infection; or after symptom resolution (64-67).

There is currently no licensed test for the screening of blood, plasma or cell and tissue donations. Laboratory screening of blood, plasma, cells and tissues is currently not recommended. This is because transmission of COVID-19 through donated tissues and organs has not been reported; and levels of detected RNA in plasma coinciding with clinical symptoms are very low (64).

To mitigate the risk of transmission through donated organs and to ensure transplantation is conducted as safely as possible, all deceased and living donors should be tested for SARS-CoV-2 with negative results obtained prior to transplantation proceeding; The practice of routine testing of potential recipients of deceased donor organs should be determined by the local transplant unit in consultation with infectious disease clinicians. Transplant teams should have the discretion to proceed prior to test results being available in time constrained circumstances.

Donation should not proceed from deceased individuals in whom there is a clinical suspicion of COVID-19.

For further information, including specific guidance on testing for donors and recipients and when to proceed with donation and transplantation, refer to *the Organ and Tissue Authority, DonateLife and the Transplantation Society of Australia and New Zealand - Coronavirus (SARS-CoV-2) causing COVID-19: Information for donation and transplant professionals*.

Prioritising samples for testing

Processing of respiratory samples from donors (including all unrelated haemopoietic stem cell donors) and recipients should be prioritised in order to enable expedited retrieval and transplantation processes. Increasing availability of rapid testing may expedite testing timeframes to support time criticalities for deceased donor testing (see *PHLN guidance on laboratory testing for SARS-CoV-2).*

Interstate travel for tissue and organ retrieval and transplantation teams

To protect the health and safety of all involved in organ retrieval and transplantation during the COVID-19 pandemic, where possible, local teams should conduct surgical retrieval of organs within the donor hospital. Where this is not possible, organ and tissue retrieval and transplantation teams should not be restricted from interstate travel for the purpose of tissue and organ procurement or delivery.

Quarantine

Asymptomatic donors and recipients without any other epidemiological risk factors are not classified as suspect cases and do not need to be quarantined or isolated following testing, unless a positive test result is received.

Appendix G: Full revision history of the COVID-19 SoNG

Revision history

Version	Date	Revised by	Changes
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases

Version	Date	Revised by	Changes
			Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.

Version	Date	Revised by	Changes
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.

Version	Date	Revised by	Changes
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.

Version	Date	Revised by	Changes
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 6.0

08 November 2021

Summary of revision history

For full revision history, please refer to Appendix G

Version	Date	Revised by	Changes
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for COVID-19. Jurisdictions may adapt this guidance based on local epidemiological context.

Updates to this guideline reflect community transmission in some jurisdictions and Australia's progress through the *National Plan to transition Australia's National COVID-19 Response*. Please see Appendix B for additional considerations for jurisdictions with low or no community transmission. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – initiate public health responses as soon as possible. Public health responses may be automated and prioritised to assist with maintaining public health workforce capacity.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status.

Hospitalised confirmed cases should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of confirmed COVID-19 patients, including personal protective equipment (PPE), see ICEG-endorsed infection control guidance.

Historical cases do not need to isolate and public health units (PHUs) do not need to follow up their contacts. .

Contact management

PHUs should manage close contacts according to management of contacts guidance.

Unvaccinated or partially vaccinated close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period. Vaccinated close contacts must quarantine for 7 days following last close contact with the confirmed case during their infectious period. Close contacts should monitor for development of fever or COVID-19 symptoms during this period, where feasible, and test for SARS-CoV-2 if symptoms develop.

2. Key definitions

Low or no community transmission

Low or no community transmission, in this guidance refers to infrequent or no COVID-19 cases acquired within a PHU's geographic area of responsibility.

Community transmission

Community transmission, in this guidance refers to when there are multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction.

Fully vaccinated person

Fully vaccinated refers to a person who is ≥14 days following receipt of the final dose of a primary course of COVID-19 vaccine approved or recognised by the Therapeutic Goods Administration (TGA)[1].

Partially vaccinated person

Partially vaccinated refers to a person who has received at least one dose of a COVID-19 vaccine registered by the TGA but does not meet the definition of a fully vaccinated person.

Reinfection

A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed COVID-19 that is determined to be a separate episode to the first based on epidemiological and/or laboratory findings. SARS-CoV-2 RNA detection must be greater than 90 days after the first laboratory confirmed infection to be considered reinfection. Wherever feasible, whole genome sequencing should be undertaken for suspected reinfections.

Breakthrough infection

A confirmed episode of SARS-CoV-2 infection in a fully vaccinated person > 14 days following their final dose of a primary course of COVID-19 vaccine.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

[1] There may be differing operational definitions of fully vaccinated in jurisdictions and for purposes of international travel.

3. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. In 2021, the SARS-CoV-2 Delta variant became the predominant variant of the virus in Australia.

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (1).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (2). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (2).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings, in the context of certain behaviours, such as singing and shouting (3) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (2). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (4, 5). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (6).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of early SARS-CoV-2 variants ranged from 2–4 (7). R_0 for confined settings were potentially at the higher end of this range. The Delta variant of SARS-Cov-2 is more transmissible than previously identified variants with infectiousness nearly twice that of the historical variant (8).

Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (9, 10).

SARS-CoV-2 variants of concern or interest

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (11, 12). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information please see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

The Communicable Diseases Genomics Network (CDGN) actively monitors variants and their reported mutations to understand how they influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see Infection Control Expert Group (ICEG) endorsed infection control guidance.

Incubation period

Prior to the emergence of the Delta variant, the median incubation period for people who became symptomatic was 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (13-15). Around 1% of COVID-19 cases developed symptoms more than 14 days after exposure (16). Evidence for the Delta variant incubation period is still emerging, however some studies suggest it may be shorter than other lineages (17, 18).

There is currently limited evidence to determine how the incubation period for breakthrough infection in vaccinated individuals may differ from infection in unvaccinated individuals.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (19, 20). Pre-symptomatic transmission can occur 1-3 days before symptom onset (21, 22). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (23).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms

(20). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (23). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (24).

It has been demonstrated that the Delta variant is associated with higher viral burden and longer duration of viral shedding compared to previous variants of SARS-CoV-2 (25, 26). Currently available evidence suggests that initial viral load is similar between vaccinated and unvaccinated individuals, however some studies have found that vaccinated people have a more rapid decline in viral load than unvaccinated people (27-29).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the PHU. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (30-32). Other symptoms include headache, sore throat, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (30-33). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (34).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. International cohort studies have suggested unvaccinated or partially vaccinated people infected with the Delta variant are more likely to be hospitalised than patients infected with the Alpha variant (35, 36)

Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (19, 20, 37-40). It is unclear at this stage whether the higher viral burden associated with the Delta variant has changed the proportion of asymptomatic infections.

Fully vaccinated people can still become infected though infection is less likely than in someone who is unvaccinated. Disease associated with breakthrough infection is less severe, however, the risk of onward transmission appears to be similar to that for unvaccinated individuals (41); however the period of infectiousness appears to be shorter in vaccinated cases. Severe disease can still occur in a small proportion of vaccinated people particularly the elderly and those with certain co-morbidities (42, 43).

COVID-19 in children

Acute infection with SARS-CoV-2 is generally associated with mild disease in children, and compared to adults, children have almost 25 times lower risk of severe disease (44, 45). However, however the period of infectiousness appears to be shorter in vaccinated cases. children may be hospitalised for social, rather than clinical, reasons, for example if both parents are too unwell to care for them. A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally

associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (46).

Longer term outcomes of COVID-19

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (47). A large systematic review of the body of evidence collected on the post-acute sequelae of COVID found the median proportion of COVID-19 survivors experiencing at least one sequelae was 54% at 1 month (short-term), 55% at 2 to 5 months (intermediate-term), and 54% at 6 or more months (long-term.) (48, 49). In the UK, prevalence of self-reported post-acute sequelae of COVID-19 has been highest in people aged 35 to 69 years, females, people living in more disadvantaged areas, people working in health or social care, and people with disabilities (50).

Case fatality rate

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.0% (51). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems and patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is 1.0% (based on surveillance data notified in Australia as of 03 November 2021). As of 03 November 2021, 46% (812/1768) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (52).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (52). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (52, 53).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (53). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (53). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Durability of immunity after SARS-CoV-2 infection likely differs significantly from person to person depending upon a range of factors (age, co-morbidities and pre-existing immunosuppression and previous vaccination). Studies suggest a strong immune response after previous infection, with effective natural immunity to future infectious in most individuals (54). However, vaccination continues to provide the best protection against reinfection (55-59).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- Come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including:

- multiple exposure points;
- staff who may have a perceived need to continue work despite being unwell; and
- language barriers for people from culturally and linguistically diverse backgrounds.

Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

4. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and, as much as possible, disease transmission. It is anticipated that high levels of COVID-19 vaccination coverage will facilitate the progressive winding back of public health and social measures such as travel restrictions and physical distancing.

As of October 2021, the Australian Technical Advisory Group on Immunisation (ATAGI) recommends vaccination for all individuals aged 12 years and over in a two-dose vaccine schedule (3 doses for severely immunocompromised individuals). ATAGI supports the use of a single booster dose for people who completed their primary COVID-19 vaccine course ≥6 months ago. This will initially include, but not be limited to, groups who were prioritised in the rollout of the vaccine program from early 2021. For more information, please see ATAGI recommendations on the use of a booster dose of COVID-19 vaccine.

The COVID-19 vaccines registered for use in Australia have all been shown to be highly effective against severe disease, including due to the Delta variant (60). Vaccine effectiveness against hospitalisation due to Delta infection has been shown to be 95.2% and 98.4% for Vaxzevaria (AstraZeneca) and Comirnaty (Pfizer), respectively, 2 to 9 weeks following the second dose (60). The effectiveness of these two vaccines against death has been shown to be 94.1% and 98.2%, respectively (60). Existing vaccine safety monitoring systems have been strengthened, with weekly COVID-19 vaccine safety reports provided by the Therapeutic Goods Administration and AusVaxSafety active surveillance system.

Other prevention activities

When combined, prevention and control activities, can help limit the spread of certain respiratory diseases, including COVID-19. These measures may include:

1. Physical distancing and gathering
    - Physical distancing can reduce the potential for transmission. Physical distancing measures may include:
        - maintaining a distance of 1.5m from people
        - density restrictions; and
        - limits on the number of people allowed to participate in an event.
2. Environmental controls, such as optimised ventilation

3. Personal hygiene
    - PHUs should encourage good hygiene practices to prevent SARS-CoV-2 infection including:
        - wearing a face mask where physical distancing cannot be maintained, particularly indoors;
        - staying home if unwell;
        - effective hand and respiratory hygiene; and
        - cleaning surfaces
4. Travel restrictions
    - Some jurisdictions will require quarantine or testing of domestic and international travellers. See *COVID-19 FAQs- international travellers to Australia.*

5. Surveillance

There are five main objectives of surveillance for COVID-19, which are to rapidly:

1. Identify, isolate and manage cases.
2. Identify, quarantine and provide relevant information to contacts.
3. Detect and manage clusters and outbreaks, and
4. Characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place;
    - describing the transmission dynamics;
    - identifying groups at special risk of infection or more severe disease; and
    - monitoring for SARS-CoV-2 variants.
5. Monitor the effectiveness of the following routine prevention and control activities, in managing the COVID-19 outbreak over time:
    - vaccination;
    - test, trace, isolate and quarantine processes; and
    - public health and social measures.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, vaccination status, place of residence, occupation, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be collected, with additional information being followed up based on risk assessment.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

PHUs should enter initial information on confirmed and historical cases of COVID-19 onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enter enhanced surveillance data shortly after case follow-up. Jurisdictions are encouraged to prioritise and automate as many of these processes as possible, including linking COVID-19 cases to clinical services.

6. Cases

Definitions

Reporting

Notify both confirmed cases and historical cases in the jurisdiction of public health management.

People meeting the confirmed or historical case criteria who were previously diagnosed and managed overseas or in another Australian jurisdiction do not need to be re-notified. In this situation, the person should provide documented evidence of diagnosis overseas or interstate to the PHU.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing;

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[1].

Historical case

The historical case definition intends to capture cases who were infected sometime in the past that were not previously reported and are not considered infectious at the time of diagnosis. Further laboratory testing is required to meet this criterion.

A historical case requires:

i. Laboratory evidence to support a historic infection; **AND**

ii. Absence of clinical evidence in the 14 days prior to swab date of positive test

Laboratory evidence for historic infection:

1. For people who have not been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[2]; **AND**
    - A subsequent PCR is negative OR suggestive of a historical infection[2], taken at least 24 hours apart; **AND**
    - Detection of IgG or total antibody[1];

OR

2. For people who have been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[2]; **AND**
    - A subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence

- Fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[3]; or
- Loss of smell or loss of taste.

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[2] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

[3] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Specimen collection and testing for SARS-CoV-2

Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) or transcription-mediated amplification (TMA) is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection. For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; and different types of SARS-CoV-2 specific testing, see *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Alternative testing methods, including rapid antigen testing for SARS-CoV-2, may be used in specific contexts and settings where pre-test probability is high. See *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests*. PHUs should follow jurisdictional guidance on the use of rapid antigen tests.

See *CDNA and PHLN Testing Framework for COVID-19 in Australia* for guidance on local approaches to testing, including key priority groups based on the likelihood of infection and the epidemiological situation.

Guidance on Personal Protective Equipment (PPE) for specimen collection is available from *ICEG-endorsed infection control guidance*.

Who to test for SARS-CoV-2

It is important to maintain high rates of testing to rapidly detect all infections and identify chains of transmission in the community.

Test the following people:

1. **Symptomatic People**

People who have at least one of the following COVID-19 like symptoms should test for SARS-CoV-2.

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat); or
- Loss of smell or loss of taste.

Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. SARS-CoV-2 testing should be considered when assessing patients presenting with non-specific signs of infection.

2. **Asymptomatic people**

People who have higher risk of exposure to SARS-COV-2 should test for SARS-CoV-2, including:

- Close contacts of COVID-19 cases
- People who provide care for COVID-19 cases (e.g. Health care workers).
- Domestic and international aircrew
- International arrivals
- Workers in managed quarantine facilities

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHUs should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Stay at home requirements after COVID-19 testing

Health care workers providing testing services should clearly communicate the following stay at home requirements after COVID-19 testing:

1. Symptomatic people who have tested for SARS-CoV-2 should stay at home until they receive a negative test, regardless of vaccination status.
2. Asymptomatic people who are not close contacts do not need to stay at home whilst awaiting a negative test result, unless instructed to stay at home by a public health authority.

Please see Management of Contacts for guidance on quarantine and testing of close contacts.

Please see Appendix B for additional post-testing instructions for jurisdictions with low or no community transmission.

Assessing indeterminate and suspected false positive PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and, where required, have procedures in place to confirm test results. Where there is active COVID-19 in the community, the positive predictive value of PCR testing is very high (with the exception of persistent shedding). However, indeterminate or suspected false positive SARS-CoV-2 test results may still occur. PHUs may assess indeterminate or suspected false positive PCR results in order to avoid unnecessary isolation of cases, quarantine of contacts, and strain on public health resources.

Indeterminate or inconclusive PCR results

Indeterminate results may occur due to low viral loads; persistent shedding; or non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should contact the laboratory microbiologist to discuss the results and decide whether further testing is required. Consider results in the context of the clinical and epidemiological circumstances to inform whether further public health action is required.

PHUs can use the below actions for suspected false positive PCR results to determine whether to manage the person with indeterminate PCR results as a COVID-19 case.

Suspected false positive PCR results

PHUs might suspect a false positive SARS-CoV-2 PCR result when there are no epidemiological risk factors for COVID-19. This is particularly relevant for jurisdictions with low or no community transmission with high levels of enhanced testing.

If a false positive PCR result is suspected, PHUs should contact the laboratory microbiologist to obtain more details of the PCR test results before designating the result a false positive. The laboratory microbiologist will investigate whether there is evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required. If further laboratory investigations provide convincing evidence the case is negative, the test may be considered a false positive and the laboratory will issue an amended report.

For more information on the possible sources of false positive PCR test results, see *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

Further PHU actions for suspected false positive PCR results

PHUs should conduct further assessments (in close collaboration with the laboratory microbiologist and treating clinician) for suspected false positive results.

Consider a case conference with experienced public health practitioners, the microbiologist and the treating clinician. In some jurisdictions, there may already be established panels for this purpose. Where there is uncertainty or difficulty reaching agreement on whether the PCR is a false positive, assess the risks associated with missing a true COVID-19 case.

PHUs should:

1. Continue all relevant public health action, including case isolation and contact tracing, until the test is determined to be a false positive.
2. Thoroughly review the case's clinical history (including for mild/atypical symptoms, delayed onset of symptoms, history of compatible illness) and potential epidemiological links. Consider the likelihood of true asymptomatic infection, pre-symptomatic infection, mildly symptomatic infection, and previous infection with persistent viral shedding.
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider testing close contacts, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
5. Record the results of the investigation, including relevant laboratory information following discussion with the microbiologist, into a standard report.

PHUs can cease all public health interventions once a PCR result is confidently considered false positive. If the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed cases:

Begin follow up investigation of confirmed cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Complete case interviews, exposure site identification and close contact identification within 1 day of notification of a confirmed case. Jurisdictions may choose to prioritise cases for follow up and automate many of these case management processes.

PHUs should ensure that staff are available to contribute to the expert assessment of patients under investigation on hospital clinician or general practitioner request.

Historical cases:

Confirmed historical cases do not need to isolate and PHUs do not need to follow up their contacts.

Response procedure

Genome sequencing for all cases

Where possible, whole genome sequencing of COVID-19 cases in Australia should be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the CDGN to ensure timely reporting of genomics to AusTrakka, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no

clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

Ideally, PHUs should respond to COVID-19 case notifications as soon as possible via a case interview. However, where public health capacity is exceeded, PHUs may choose to automate and prioritise case investigation processes (e.g. SMS based questionnaires). PHUs can use Appendix A- COVID-19 PHU checklist and their state or territory COVID-19 case report as a guide for case investigation.

PHUs should ensure the following actions have taken place for each case:

- Isolate the case and confirm their last day in community
- Confirm any symptoms of the illness and the symptom onset date
- Confirm relevant pathology test results and any additional tests required, including repeat tests where relevant.
- Record vaccination status including vaccine type, dosage, date and country of administration.
- Review both case and contact management.
- Commence or complete contact tracing, aiming to place close contacts in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Where possible, identify the likely source of infection.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. For further advice on clinical management, please see:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Prophylaxis against severe disease:

Proactive use of monoclonal antibody therapy in people at high risk of developing severe disease may help prevent hospitalisation if it is administered within the first five days of developing symptoms. PHUs, in conjunction with the local clinical team, can help identify cases for clinical treatment early. For further information on emerging clinical treatments, please see *National COVID-19 Clinical Evidence Taskforce*.

Education

PHUs should educate cases about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Hospitalised COVID-19 patients

To minimise the risk of transmission from hospitalised COVID-19 patients, PHUs should encourage hospitals to undertake a system based risk assessment. Hospitals can manage risk by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Hospitalised confirmed cases should be isolate in a negative pressure room with anteroom, where available. If a negative pressure room is not available, the hospitalised case can isolate in a standard isolation room or single room with negative airflow as an alternative. Avoid rooms with positive pressure airflow.

If there is concern about a potential exposure related to a hospitalised case, PHUs should undertake a risk assessment on hospital staff, visitors or other patients to determine whether further public health response is required (See Appendix D).

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital (see above), at home, or other community residential settings identified by the PHU. Cases can isolate at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- it can be assured that the home environment permits separation of the case from other household members;

- the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- there is a reasonable level of confidence of the compliance of the case.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another pathogen.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, testing for other respiratory pathogens should be performed.

PHUs should use the following criteria to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing in accordance with *PHLN guidance for serological testing in COVID-19*, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHUs and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms that do not report Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Release from isolation criteria for all confirmed cases who do not meet historical infection criteria

The following information details release from isolation criteria for confirmed cases. This includes confirmed cases infected with a SARS-CoV-2 variant of concern.

Laboratory based evidence suggests that people infected with the Delta variant have higher viral loads which remain high for a longer period of time than people infected with other known variants. There is a very small risk that a person infected with the Delta variant may still be infectious despite meeting release from isolation criteria listed below (Unpublished data). However, this very low risk does not justify extension of the release from isolation period beyond 14 days, nor justify a requirement for PCR testing prior to release for all cases (see Release from isolation and high-risk settings)

Cases can be released from isolation if they meet the appropriate criteria in any of points 1 or 2 – whichever is applicable. Significantly immunocompromised cases will also need to meet additional criterion in point 3 in order to be released from isolation.

1. Confirmed cases who have remained asymptomatic or have resolution of fever and acute respiratory symptoms

Fully vaccinated case	Unvaccinated/ partially vaccinated case or unknown vaccination status
The case can be released from isolation if: • at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed during this period; or • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1].	The case can be released from isolation if: • at least 14 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed during this period; or • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1].

Some jurisdictions may support earlier release if: • at least 7 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed; or • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]; and • PCR is negative at day 7 from symptom onset (for symptomatic cases) or specimen collection date (for asymptomatic cases).	Some jurisdictions may support earlier release if: • at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed; or • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]; and • PCR is negative at day 10 from symptom onset (for symptomatic cases) or specimen collection date (for asymptomatic cases).

2. Confirmed cases without complete resolution of acute respiratory symptoms

Fully vaccinated case	**Unvaccinated/ partially vaccinated case or unknown vaccination status**
The case can be released from isolation if they meet **both** of the following criteria: • at least 14 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • the case is not significantly immunocompromised[3] OR The case can also be released from isolation if they meet **all** the following criteria: • at least 10 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and	The case can be released from isolation if they meet **both** of the following criteria: • at least 20 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • the case is not significantly immunocompromised[3] OR The case can also be released from isolation if they meet **all** the following criteria: • at least 14 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and

• two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 7 from symptom onset.	• two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 10 from symptom onset.

3. Significantly immunocompromised persons

In addition to meeting the appropriate criteria described in points 1 or 2 above, confirmed cases who are significantly immunocompromised[3] must meet a higher standard requiring additional assessment.

Regardless of vaccination status, COVID-19 cases who are immunocompromised can be released from isolation when they meet the following additional criterion:

- PCR negative[2] on at least two consecutive respiratory specimens collected at least 24 hours apart after day 7 from symptom onset[4].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). PHUs should discuss this with the treating medical practitioner and the testing laboratory.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Testing after release from isolation

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case has not re-developed COVID-19 symptoms but is swabbed and tests positive after they have met the above release from isolation criteria, then the case does not require re-isolation. Current evidence and Australian public health experience indicates these people are unlikely to be infectious.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness consistent with a historic infection, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Release from isolation and high-risk settings

Cases returning to a high-risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

However, there is some laboratory based evidence that a small proportion of people with a Delta variant infection may still be infectious despite fulfilling the appropriate criteria above. Some jurisdictions with low or no community transmission may require additional criteria or measures for cases who will be released back to high-risk settings.

Note: Hospitalised patients who are being transferred to another ward or hospital should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non COVID-19 related condition.

Release from isolation and re-exposure

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the re-exposure was less than 6 months since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic).

Recovered cases, unless immunocompromised, can continue to attend high-risk settings and do not need to be furloughed from work if re-exposed during this 6 month period.

For recovered cases re-exposed after 6 months from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist and/or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be re-tested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Release from isolation and gastrointestinal symptoms

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. Cases who have persistently positive faecal samples test results after meeting release from isolation criteria, may need to follow further precautions or exclusions on a case-by-case basis:

- All cases with diarrhoea should not prepare/ food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. health care workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. People who remain persistently PCR positive in faecal samples use soap and water or alcohol-based sanitiser for hand hygiene. PHUs should provide education emphasising the importance of proper hand hygiene to all cases upon release from isolation.

7. Contacts

Close contact definition

The aim of contact tracing is to interrupt transmission of SARS-CoV-2 through identification and quarantining of people in contact with infectious cases. PHUs can use the below close contact criteria to identify and prioritise people who may have been exposed and potentially incubating the disease.

In jurisdictions with community transmission, where public health workforce capacity is exceeded, PHUs should focus contact tracing efforts on higher risk close contacts in households or settings at highest risk of extensive transmission.

Close contact priority	Contact made during the case's infectious period
Higher risk close contact	A person who has had at least 15 minutes face to face contact with a COVID-19 case and there is reasonable risk of transmission including: • Household contacts • Social contacts with extensive interaction with the case • Contacts in settings at highest risk for extensive transmission or severe outcomes of infection (e.g. Abattoirs, hospitals, accommodation facilities for vulnerable people)
Lower risk close contact	A person who has had less than 15 minutes face to face contact with a COVID-19 case and there is some risk of transmission based on: • vaccination status of both case and contact; • PPE use of both case and contact (e.g. mask type, see Appendix D for health care settings) • the setting (e.g. indoors vs outdoors, size of room, adequacy of ventilation); • the specific variant of SARS-CoV-2; and • the nature of the exposure (e.g. whether shouting or singing).

It is difficult to prescribe a minimum duration of contact that results in infection, as even fleeting personal interactions can result in infection with SARS-CoV-2. The definitions of close contacts listed above represent prioritisation based on risk of infection in a setting where some COVID-19 transmission is acceptable in the community.

Some jurisdictions have developed risk matrices for classification of close contacts in certain settings (e.g. for schools, workplaces). The rationale for risk assessment guidance is to balance COVID-19 transmission risk with the risk of furloughing staff to the extent that the business becomes non-operational. Such guidance will take account of specific risk mitigations within the operation of the business.

For additional considerations for identification of contacts in jurisdictions with low or no community transmission see Appendix B.

Note that:

- For contact tracing, the infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).
- If the case is asymptomatic, the infectious period is the period extending from 48 hours before the initial positive test until the case is classified as no longer infections (refer to Release from isolation).
- For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, please see Appendix D.

Management of contacts

PHUs should assess all persons identified as having had contact with a confirmed case to determine if they should be managed as a close contact. Where possible, PHUs should collect demographic and epidemiological data. Jurisdictions are encouraged to automate contact management processes where feasible.

Quarantine and restriction of close contacts

Where feasible, PHUs should ensure careful selection of a contact's site of quarantine to prevent transmission to others. Some residences may not be feasible if the person cannot quarantine away from other house members (e.g. small apartments, dwellings with multiple generations of family members).

The precautionary advice in this guideline uses an incubation period upper range of 14 days to guide public health measures such as quarantine. However jurisdictions may wish to consider alternate options for quarantine, including a possible mixed model approach (shorter quarantine followed by a time period of less stringent restrictions) based on local risk assessment.

Close contacts who have recovered from COVID-19 do not need to quarantine if:

- they remain asymptomatic;
- they are not immunocompromised; and
- re-exposure is less than 6 months since symptom onset (see Release from isolation and re-exposure).

In jurisdictions with community transmission, where public health workforce capacity is exceeded, PHUs should focus close contact management efforts on higher risk close contacts. Some jurisdictions may choose to have less active management of lower risk close contacts.

PHUs should advise close contacts to:

1. Monitor their health.
    - PHUs should provide advice on the processes for seeking medical care, including how to safely seek COVID-19 testing if symptoms develop. Refer to Medical care for quarantined individuals.
    - Resourcing permitting, PHUs may conduct active monitoring of close contacts for COVID-19 symptoms for 14 days after last possible contact with a confirmed COVID-19 case. This may include via daily SMS follow up.

2. Quarantine for a specified period following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for the specified minimum period regardless of any negative test result (see below).
3. Get tested during the quarantine period (see below table).

Quarantine and testing requirements for close contacts

Fully vaccinated close contacts	Unvaccinated/partially vaccinated close contacts or unknown vaccination status
Quarantine requirements • At a minimum, fully vaccinated close contacts should quarantine for 7 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. • Quarantine must occur for 7 days regardless of any negative test result. **Testing during quarantine** • Testing of close contacts should occur: ○ If COVID-19 symptoms develop ○ On entry to quarantine ○ Before exit from quarantine - A test late in the quarantine period (e.g. after day 5-post exposure), should be conducted. - In some circumstances, PHUs may also consider the need for extension of quarantine if a close contact refuses to undergo exit testing. • If laboratory testing systems are under strain, PHUs may consider not testing close contacts (particularly household contacts) who develop symptoms, and instead considering them probable cases if they develop symptoms. **Other measures** • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house. • Jurisdictions with low or no community transmission may implement more conservative approaches.	**Quarantine requirements** • At a minimum, unvaccinated or partially vaccinated close contacts should quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. • Quarantine must occur for 14 days regardless of any negative test result. **Testing during quarantine** • Testing of close contacts should occur: ○ If COVID-19 symptoms develop ○ On entry to quarantine ○ Before exit from quarantine - A test late in the quarantine period (e.g. day 12-13), should be conducted. - In some circumstances, PHUs may also consider the need for extension of quarantine if a close contact refuses to undergo exit testing. ○ Mid-quarantine (where appropriate) - If there is reason to doubt compliance with quarantine or high risk of the close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies are useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix C: Outbreak investigation and management).

Health and residential care workers

For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, please see Appendix D.

Aircraft passengers and crew

Passengers

At a minimum, PHUs should classify aircraft passengers seated in the same row or two rows in front or behind a confirmed COVID-19 case during the case's infectious period as close contacts. PHUs in jurisdictions with low or no community transmission may classify all passengers on board the flight as close contacts. PHUs can use similar criteria for people who have had close contact on bus or train trips.

Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport.

Risk assessment and management of aircrew

For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify aircrew close contacts. Refer to Appendix E and Appendix F for further information.

Quarantine and essential workers

Close contacts who are essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, PHUs should conduct an individual risk assessment to identify if some essential workers can be permitted to maintain normal work patterns while in quarantine.

This should only occur in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If permitted to maintain normal work patterns, the essential worker must practise vigilant physical distancing and hand and respiratory hygiene, and wear a mask whilst at work. They should adhere to normal quarantine restrictions when outside of essential work activities.

Medical care for quarantined individuals

PHUs should advise close contacts that if they require medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department and advise them of their close contact status before presenting. Close contacts with severe symptoms should call 000 and clearly communicate to the emergency services operator that they are a close contact. Close contacts should wear a mask before presenting to any health care setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with COVID-19 develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by the PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

8. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

9. Special situations

Use of COVID-19 vaccination in outbreak situations

During COVID-19 outbreaks[1], targeted vaccination of identified, unvaccinated individuals at risk of exposure can supplement existing public health interventions. Examples of groups where targeted vaccination may occur include: individuals in closed populations, population groups with low vaccine coverage, or groups that are at higher risk of severe outcomes.

PHUs can use COVID-19 vaccination for two purposes in the context of an outbreak:

1. As an outbreak management strategy to reduce the number and severity of COVID-19 cases in an outbreak, where there is likely to be an ongoing risk of exposure.
2. To opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

COVID-19 vaccination in outbreak management

There is no evidence to support the use of COVID-19 vaccination in first generation close contacts for the purpose of post-exposure prophylaxis. It takes around 14 days for a protective effect to be seen following the first dose of the Pfizer, AstraZeneca and Moderna vaccines (61)s. Vaccination as an outbreak response tool is likely to be of highest utility in closed settings and where there is an ongoing risk of exposure which may cause multiple chains of transmission, such as residential aged care facilities or correctional facilities. In this context, vaccination may be considered for unvaccinated individuals with the goals of:

- Direct protection against severe outcomes and death in vaccinated people.
- Limiting outbreak size and duration by reducing the risk of onward transmission, and thereby reducing morbidity/mortality/demand on clinical and public health resources.

Decision-making around the use of COVID-19 vaccines during outbreaks should consider:

- The location, outbreak context, local epidemiology and likelihood of ongoing risk of exposure (beyond 14 days following vaccination) must be considered in the development of an outbreak vaccination strategy.
- The target population for vaccination should be clearly defined.
- Where there is constrained vaccine supply, priority should be given to those:
    - who have not yet received a first dose of vaccine.
    - at risk of severe outcomes or in whom non-pharmaceutical interventions are not possible (such as those unable to physically distance).
    - at highest risk of transmission of SARS-CoV-2.
- Evaluation should be undertaken after the conclusion of the outbreak.

Opportunistic vaccination

In geographic areas where an outbreak is occurring, opportunistic vaccination of eligible groups may be used to improve vaccination coverage in the population. Outbreaks present an opportunity to promote the benefits of COVID-19 vaccination to the broader community.

Note:

1 For the purposes of vaccination during outbreaks, an outbreak is defined as a single confirmed case of COVID-19 in the community. Individual jurisdictions' outbreak definitions may differ

International travellers

Quarantine requirements for international travellers entering Australia are different for fully vaccinated versus partially or unvaccinated arrivals. It is important to note that the definition of fully vaccinated for international travel purposes differs to the definition included in this guidance. For more information about vaccination and international travel, pre-flight testing and travel requirements, please see *International travel and COVID-19* and *Coronavirus (COVID-19) FAQs – international travellers to Australia*.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

If a confirmed case has attended the workplace while infectious, PHUs can assist workplaces to conduct a risk assessment of potential workplace transmission. This includes assisting workplaces in the identification of workers who have had close contact with the infected worker. PHUs should provide workplaces with a general framework to help with internal risk assessment. In settings with high vaccine coverages, PHUs may take a more considered approach to risk assessment to ensure that economic and social costs are minimised. For more information, see *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

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11. Appendices

Appendix A:	Public health unit checklist
Appendix B:	Additional considerations for jurisdictions with low or no community transmission
Appendix C:	Outbreak investigation and management
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Appendix A: Public health unit checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case; and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to High-risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection and follow the cross-border protocol for notifying cases to other jurisdictions as appropriate.

Consider need for media release and designate a media spokesperson.

Appendix B: Additional considerations for jurisdictions with low or no community transmission

This appendix provides additional testing and contact management considerations for PHUs in jurisdictions with low or no community transmission. PHUs in jurisdictions with low or no community transmission may decide to trace and manage casual and secondary close contacts.

As jurisdictions move towards a context of community transmission, and public health capacity is exceeded, PHUs may discontinue using this additional guidance.

Additional testing considerations

In jurisdictions with low or no community transmission, individuals meeting the suspect case definition may be tested for SARS-CoV-2.

Jurisdictions with low or no community transmission may also conduct additional testing for screening purposes, for example in COVID-19 quarantine and isolation facilities and workers in health care settings.

Applying a suspect case definition

In jurisdictions with low or no community transmission, PHUs can use the suspect case definition to identify those who may have an increased likelihood of current SARS-CoV-2 and where having such a definition may continue to have public health utility.

Suspect cases may require specific infection prevention and control measures and public health management. Suspect cases do not need to be notified to the NNDSS.

A suspect case is a person who meets the below **clinical** and **epidemiological** criteria.

Clinical evidence (in the past 14 days):

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[1]; or
- Loss of smell or loss of taste.

Epidemiological evidence (in the past 14 days):

- Close contact with a confirmed case
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services
- International air, maritime and border staff
- Health care workers with potential COVID-19 patient contact
- People who have been in areas with COVID-19 community transmission

Notes:

[1] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Management of suspect cases

PHUs may consider undertaking case interviews, exposure site identification and close contact identification for suspect cases. PHUs may undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and there remains high suspicion that the person has COVID-19, PHUs may support continued isolation and use of relevant infection prevention and control precautions, whilst awaiting further testing and re-assessment (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*.

Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. See Post-testing instructions and isolation requirements for suspect cases and enhanced testing.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions with low or no community transmission may conduct routine testing of international travellers who are in hotel quarantine. Testing may occur on day 0–2 and then on day 12-14, preferably as late as possible, of hotel quarantine. Some jurisdictions may undertake mid-quarantine testing for earlier identification of cases and require confirmation of exit testing prior to release from quarantine. Some jurisdictions may also require further testing after the traveller has left managed quarantine.

Exact arrangements for post-quarantine testing depend on state and territory protocols.

COVID-19 quarantine and isolation facility workers

Some jurisdictions may require COVID-19 quarantine and isolation facility workers to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may implement additional requirements for quarantine workers. See Australian Health Protection Principal Committee (AHPPC) statement on National Principles for Managed Quarantine.

Testing in health care settings

Jurisdictions with low or no community transmission may request routine testing of staff in health care settings, in addition to other control strategies. Periodic and comprehensive screening of staff in health care settings can assist in earlier identification of infection in health care environments.

Routine testing of staff in health care settings is recommended on a voluntary basis. However, jurisdictions may determine the triggers for when routine testing is implemented and implement mandatory testing in certain high-risk situations. Jurisdictions may determine

the appropriate frequency and method for routine testing, depending on the specific circumstances.

Considered routine testing for health care setting staff who:

- directly care for COVID-19 patients
- work at COVID-19 testing sites
- provide occasional or intermittent care to COVID-19 patients (e.g. medical consulting units, pharmacists, allied health)
- work within the patient/client/resident zone for COVID-19 patients (e.g. ward clerks, cleaners, pharmacy deliveries, food delivery)
- transport a COVID-19 patient to a health care setting work in high risk areas of the hospital that don't have confirmed cases (e.g. staff in emergency departments)
- work in community health centres (e.g. GP led respiratory or fever clinics)

Provided they do not have COVID-19 symptoms and are not a close contact, staff in health care settings who undergo routine testing are not required to isolate whilst awaiting a negative result and may continue to work.

If staff are away from work for 7 days or more, they may be requested to undertake a COVID-19 test with oropharyngeal and deep nasal or nasopharyngeal swabs. E.g. Every 7 days while away until 14 days have passed since they were last at work.

Jurisdictions may also need to consider testing requirements for staff:

- working across wards or campuses
- working between hospitals/jobs
- who are inpatients or outpatients
- visiting high-risk settings such as hospitals or aged care facilities

The need for routine testing in these circumstances should be assessed case-by-case, giving consideration to the associated level of risk.

Post-testing instructions and isolation requirements for suspect cases

The following post-testing instructions apply for suspect cases and individuals who have undergone enhanced testing in jurisdictions with low or no community transmission.

1. Symptomatic people who are not contacts of a confirmed case should stay at home until they receive a negative test AND their symptoms resolve, regardless of vaccination status.
2. Symptomatic people who have tested for SARS-CoV-2 and are contacts of a confirmed case should stay at home or remain in quarantine for the period set by the PHU, regardless of negative test result.

Please see Additional contact management considerations for guidance on quarantine and testing of contacts in jurisdictions with low or no community transmission.

If the test results come back positive – see Case management.

Additional contact management considerations

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. In low or no community transmission settings, where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) may be undertaken. This is particularly important when the public health aim is to identify all potential unrecognised chains of transmission and the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing may be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. PHUs may consider following up any person who in that period who had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts may be screened for possible symptoms and be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing may be considered for potential source contacts who are unvaccinated and asymptomatic (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive via PCR or (for unvaccinated individuals) a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain. Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Alternative primary close contact definition

In jurisdictions with low or no community transmission, PHUs may use the following expanded definition of a primary close contact, as a precautionary measure (resourcing permitting).

A primary close contact is defined as a person who has:

- had face-to-face contact with a confirmed case during their infectious period; or
- shared a closed space with a confirmed case during their infectious period, where there is reasonable risk of transmission based on a risk assessment performed by the PHU, taking into account:
    - transmission having been proven to have readily occurred in this (or a similar) setting;
    - the specific variant of SARS-CoV-2;
    - the adequacy of air exchange in an indoor environment; or
    - the nature of the exposure (e.g. type of contact, mask use, whether shouting or singing, size of venue etc.).

Note that:

- The infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered, at the discretion of the PHU.

Alternative management of primary close contacts

PHUs in jurisdictions with low or no community transmission may request primary close contacts to do the following actions, regardless of vaccination status:

- Quarantine for 14 days following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- Monitor their health. PHUs may conduct active daily monitoring of primary close contacts for COVID-19 symptoms for 14 days after the last possible contact with a confirmed COVID-19 case. This includes SMS contact.
- Get tested during the quarantine period (see below).

Advise primary close contacts on the processes for seeking medical care, including how to safely seek COVID-19 testing if they develop symptoms. Refer to Medical care for quarantined individuals.

In jurisdictions with low or no community transmission, testing of primary close contacts may occur:

1. If COVID-19 symptoms develop
2. On entry to quarantine
    - A positive test result would make the primary close contact a case and support an earlier decision to move the person to an alternative place for isolation and bring forward contact tracing for that person.
3. Before exit from quarantine

- A positive test result late in the quarantine period (e.g. day 10–13), prevents the release of potentially infectious people into the community.
- In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

4. Mid-quarantine (where appropriate)
    - If there is reason to doubt compliance with quarantine or high risk of the primary close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Identification of casual contacts

In jurisdictions with low or no community transmission, and at the discretion of the PHU, there is likely to be some utility in following up casual contacts in addition to close contact as a precautionary measure (resourcing permitting).

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a close contact.

In jurisdictions with low or no community transmission, and at the discretion of the PHU, some casual contacts may be reclassified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to individuals who do not meet the close contact definition.

The following factors may be considered prior to reclassifying casual contacts as primary close contacts:

- Epidemiological context, including level of community transmission.
- The specific variant of SARS-CoV-2.
- The potential for large scale amplification in the given setting or venue
- Jurisdictional capacity and resourcing requirements, including opportunity costs of managing them as close contacts
- Feasibility and resulting impacts of public health measures on essential services (e.g. provision of health care services)
- Vulnerability of the contacts.

Depending on the above factors, PHUs may implement a range of options for management of casual contacts in different settings.

Management of casual contacts

Quarantine and testing requirements for casual contacts

Fully vaccinated casual contacts	Unvaccinated or partially vaccinated casual contacts
1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events) • At a minimum, fully vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required. **2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • Casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.	**1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events)** • At a minimum, unvaccinated or partially vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required. **2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • Unvaccinated or partially vaccinated casual contacts may be requested to enter into quarantine, depending on the local epidemiology. If quarantine is indicated, a shorter term quarantine until around 5 days after exposure is appropriate. • They should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • If quarantined, the unvaccinated casual contact may exit quarantine once a negative day 4-6 PCR result is returned. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.

Note: For guidance on management of casual contacts who are workers in healthcare settings, please see Appendix D.

Identification of secondary close contacts

In jurisdictions with low or no community transmission, and at the discretion of the PHU, there may be some utility in following up secondary close contacts as a precautionary measure (resourcing permitting).

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact or shared a closed space in any setting with a primary close contact of a COVID-19 case, from 24 hours after the primary contact's exposure to the case.

Identification of secondary close contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Management of secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHUs may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. lives with the case, exposed at a high-risk setting where transmission has already occurred);
- The secondary close contact is unable to remain isolated from the primary close contact (e.g. one is a carer for the other or lives in the same household);
- There will be a delay in confirming the initial case or commencing contact tracing;
- Secondary transmission has already occurred from a primary close contact to a secondary close contact;
- There are communication challenges with close contacts; or
- The consequences of the secondary case being positive is deemed very high risk (e.g. returning to a remote community).

Secondary close contacts may be quarantined until the PHU has confirmed that the primary close contact was not infectious at the time of last contact with the secondary close contact.

Household secondary close contacts

PHUs may require household secondary close contacts to quarantine until the primary close contact is cleared from quarantine.

Non-household secondary close contacts

PHUs may require secondary close contacts who are in a different household to the primary close contact to remain in quarantine until 14 days from the last exposure of the primary close contact to the confirmed case.

Alternatively, PHUs may require these secondary close contacts to remain in quarantine until there is confirmation that the primary close contact was not infectious at the last time of contact with the secondary close contact (e.g. if the primary close contact tests negative).

Appendix C: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHUs should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHUs are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHUs should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHUs should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be close contacts. These include, staff, residents (if relevant) and visitors.

PHUs may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHUs should ensure all close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHUs may also require secondary close contacts or casual contacts to quarantine.

I. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

I. Assess and record vaccination status

During outbreak investigations, it is important for PHUs to assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities*. While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.

Detailed information on environmental cleaning and disinfection in health and residential care settings is in the *COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet*. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a) With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b) In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c) Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort on Retest Day/s**
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHUs should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix D: Work Permissions and Restrictions Framework for Workers in Health Care Settings

This framework supports safe decision making when determining whether to place work permissions/restrictions, independent of quarantine, on a worker after a COVID-19 exposure in a health care setting in the context of an outbreak and community transmission of COVID-19.

Workers in health care settings include a broad array of workers including public, private, and primary care health settings. This includes workers in:

- Public health settings (e.g. public hospitals, public health clinics, ambulance services, and patient transport services)
- Private health settings (e.g. private hospital, day procedure centre or specialist outpatient services)
- Private provider facilities (e.g. general practitioners, private nurse offices, community pharmacies, consulting offices)
- Education settings in which health care students are managed to undertake placement, registration and/or internships in clinical settings

This also includes disability care workers and residential care workers, and associated students within these settings.

Health care services should apply a broad hierarchy of control framework to minimise and manage the risk of transmission of COVID-19. A system-based risk managed approach that applies appropriate mitigations reduces the risk of exposure in health care settings. However, it is acknowledged that risk cannot be eliminated and that exposures will occur.

Health services, supported by the local PHU, are responsible for considering when work permissions and restrictions are required. Health Services and Jurisdictional Departments of Health are also responsible for operationalising these guidelines including defining the reporting and escalation requirements (e.g., if multiple health services are involved) internally.

Work permissions and restrictions framework (the Framework)

The Framework provides a process and tools to support exposure assessment, work restriction and return to work decision making for workers in health care settings. The Framework is designed for workers in health care settings who have had an individual risk assessment completed after exposure to suspect or known COVID-19 case within a health care setting.

Health care managers are encouraged to be familiar with the Framework and additional jurisdictional requirements. Where possible, identify appropriate contacts to be involved in assessment teams in advance and consider training in relation to the Framework. Consider locally applying a process of monitoring and evaluation, in line with jurisdictional requirements.

The Framework includes three steps:

1. Undertake an individual risk assessment for workers in health care settings after potential exposure to a suspect or known COVID-19 case within the health care setting.
    - Assessment is conducted by appropriately trained and skilled local teams from health service providers and residential care facilities (including disability services) in collaboration with the PHU and other specialties where available and required (e.g. Infection Prevention and Control (IPC) Units, Work Health and Safety Units, Infectious Diseases Physicians).
    - Consultation should include hospital and health service operational managers, where relevant, to provide guidance on staff dynamics, workplace layouts, staffing pressure and other factors as required
    - Tools to assist the assessment at this stage are available at:
        - Table 1 – Workers in health care settings exposure risk matrix for workers who are fully vaccinated for COVID-19
        - Table 2 – Workers in health care settings exposure risk matrix for workers who are unvaccinated or partially vaccinated for COVID-19
        - Table 3 – Personal Protective Equipment (PPE) breach risk assessment and actions
2. Determine the potential impacts of work restrictions on the safe ongoing management of the health service.
3. Once exposure risk is determined in the context of the facility and work impacts, refer to the recommended work permissions and mitigations action matrix.
    - Tools to assist the assessment at this stage are available at:
        - Table 4 – Recommended work restrictions and permissions as determined by risk.

Once these steps have been completed, the health service should work with the worker and supervisor to implement appropriate actions. These actions should be in line with public health policy and directives from the Chief Health Officer. Where final actions deviate from the recommended work restrictions and permissions (Table 4), this must be approved by the relevant delegate or Chief Health Officer.

Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review a worker in a health care setting's work restrictions and permissions to facilitate continuation of essential health services.

STEP 1: Undertake an individual risk assessment of affected workers in health care settings and determine level of exposure

Factors to be considered when undertaking an individual risk assessment are:

Details of exposure event (type, dose, time):

- Case details (infectious period, transmission risk, behaviour's, vaccination status, information on viral load (CT values) if available)

- Type of exposure: types of care or potential behaviours that increase the risk of COVID-19 transmission
- Details of related transmission events in the outbreak
- Amount of cumulative time the worker has occupied the same shared space as the case including type and proximity
- Vaccination status: unvaccinated, partially vaccinated, fully vaccinated
- Staff mobility: Work across multiple facilities highly mobile within the facility, work in high-risk area.

Details of mitigations in place:

- Vaccination status of the worker (unvaccinated/ partially vaccinated/ fully vaccinated)
- PPE and IPC: correct use of appropriate PPE and IPC precautions by the case and worker

Risk assessments should be made on a case-by-case basis by local health service staff in consultation with the PHU and other relevant staff. In most circumstances, exposure risk should be determined using the appropriate health care worker exposure matrix based on vaccination status (Table 1 for fully vaccinated OR Table 2 for partial or unvaccinated).

In some circumstances, the exposure matrices provide an option of moderate or high risk, to reflect that a qualitative assessment is required to determine the appropriate level of exposure. In other circumstances, the matrix provides a clear indication of the exposure risk, however this remains subject to a case-by-case assessment. For example, in circumstances where the worker in a health care setting is immune-compromised, it may be necessary to increase the risk profile (e.g., a fully vaccinated worker may be assessed using the unvaccinated risk matrix).

Final decisions should be informed by a qualitative assessment considering variety of factors, as outlined in Steps 2 and 3. Once a risk assessment, based on the above considerations, has been conducted, it is important to characterise the situational context of the exposure to help understand the impact of a potential transmission event and whether situational factors may further mitigate or increase the level of exposure and associated risk.

Factors to consider when characterising the situational context:

- Type of work location, role, and environment (e.g., use of shared equipment, shared/communal spaces, high risk setting/persons, whether indoors or outdoors, level of vaccination coverage of workers in a health care setting)
- Other workplace mitigations in place during time of potential exposure (physical barriers, negative pressure rooms, ventilation characteristics in the relevant rooms/spaces and additional HEPA air filtration)
- Vulnerability of population (workers in health care setting and patients)
- Additional controls and residual risk of transmission in the setting (e.g. daily testing programs).

Based on these situational factors, the assessment team should consider whether the exposure risk should be amended and the worker's level of exposure risk reclassified. This will inform the final individual risk assessment, prior to moving to Step 2.

STEP 2: Assess the impacts of the work restrictions

Health services and their IPC staff, with support of PHUs, are responsible for operationalising and tailoring this guidance. This may involve consultation with other specialties where available, such as Work Health and Safety units and Infectious Diseases Specialists. While this framework cannot capture all the nuance and influential factors that may arise, the framework notes that there will be circumstances in which it is not possible to apply the recommended work permissions and restrictions as determined by the level of risk (outlined in Step 3).

In determining the final work restrictions and permissions for a staff member, the impact of these restrictions on the health services must be assessed. For example:

- If the majority or all staff in a highly specialised area are exposed
- If in a rural or regional setting where only a few staff members possess specialised skills
- If the health care service has a significant caseload without additional staff to engage.

In the first instance, health services should consider whether staff furlough can be compensated through rostering arrangements. Where possible, staff members requiring quarantine or furlough should be removed from the roster or replaced for their furlough/quarantine period.

Where this would significantly impact on the ongoing safe delivery of services, alternative rostering arrangements should be considered. This may involve:

- Redeployment of staff (e.g., accessing staff from other areas of a facility or bringing staff in from other facilities to fill roster gaps)
- Reducing hours of service operation if this can be managed whilst safely providing essential services
- Diverting patients to another facility, where this can be safely managed without overwhelming other essential health services
- Reducing the scope of service provision to only provide the highest priority care (e.g., delaying non-critical services)

Where these actions are not possible or would result in a significant disruption of essential services, it may be necessary to implement alternative mitigations so that staff members may continue working and providing essential services (see Step 3). In these circumstances, if the workforce impact is considered critical, health care services should work with the PHU to ensure their unique circumstances are considered and that appropriate mitigations are implemented (see Step 3).

STEP 3: Once exposure risk is determined, refer to the recommended work permissions and restrictions action matrix

After undertaking an individual risk assessment (Step 1) and considering impacts of work restrictions (Step 2), the assessment team should allocate a ‘risk assessment outcome’ to the worker (low, low to moderate, moderate or high). Based on the risk assessment outcome, the assessment team should consider the recommended work permission and restrictions, taking into account the impacts of these restrictions for the health care setting.

Where a worker is assessed as moderate or high risk, the PHU may recommend they undertake a period of quarantine. Where possible, workers who are advised to quarantine should complete the required quarantine period and should not attend work whilst in quarantine. However, noting that this may not be possible due to work requirements (as identified in Step 2), it may be necessary to implement mitigations so that workers may continue to work or have a reduced quarantine period.

In some circumstances, these arrangements may result in a worker who is in quarantine due to being a close contact being able to work (pending results of PCR testing) prior to being released from quarantine. This may be necessary due to substantial workforce impacts associated with the worker needing to quarantine. Workers should adhere to the guidance of the PHU. In some cases, this may involve attending work with appropriate mitigations, however being restricted from movements within the community.

The minimum recommended work permissions and restrictions for workers based on their risk assessment outcomes are outlined in Table 3. Final work permissions and restrictions should be determined in a case-by-case basis, in line with jurisdictional requirements. Additional mitigations may include:

- Daily or more regular screening requirements
- Daily testing requirements
- Additional PPE requirements
- Minimising risk of exposure to vulnerable people
- Adjusting staff rosters to minimise risk to patients and/or exposure of other staff (e.g., exposed workers tending to COVID-19 cases)

In determining the recommended work permissions and restrictions, the assessment team should also consider the work environment and individual circumstances of the worker. Adjustments to work permissions and restrictions may be required, and in some circumstances, this may involve adjusting the minimum requirements as outlined in Table 3. For example, in regional settings it may not be feasible to require daily saliva testing (recommended for high risk). In these circumstances, the assessment team may consider removing this requirement or implementing alternative arrangements.

Where the final recommended work permissions and restrictions deviate from the recommended minimum requirements (Table 4), this must be approved by the relevant delegate or Chief Health Officer. Decisions regarding the recommended work permissions and restrictions for the worker in a health care setting should be carefully documented. Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review the recommended restrictions to facilitate continuation of essential health services.

Table 1: Workers in health care settings exposure risk matrix – Fully vaccinated for COVID-19

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)		**EXPOSURE EVENT SCENARIO#**			
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.	
PPE WORN BY STAFF& CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Low to Moderate Risk	Moderate Risk	High Risk	
	Staff: Surgical mask only Case: No surgical mask	Low Risk	Low to Moderate Risk	High Risk	
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low Risk	Low to Moderate Risk	Moderate Risk Depending on risk assessment	High Risk Depending on risk assessment
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low Risk	Moderate Risk Depending on risk assessment	High risk Depending on risk assessment
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk	Low to Moderate Risk Depending on risk assessment	Moderate Risk Depending on risk assessment
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as ‘no surgical mask’. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 2: Workers in health care settings exposure risk matrix – Unvaccinated or partially vaccinated for COVID-19

Note: Mandatory vaccination requirements for workers in health care settings will be set by jurisdictions.

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)		**EXPOSURE EVENT SCENARIO#**		
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.
PPE WORN BY STAFF & CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Moderate Risk	Moderate Risk	High Risk
	Staff: Surgical mask only Case: No surgical mask	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	Moderate Risk	High Risk
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low to Moderate Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Depending on risk assessment	High Risk
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Case: No mask	Low to Moderate Risk No prolonged/ cumulative/ physical contact / Moderate Risk Prolonged / cumulative/ physical contact
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 3: PPE breach risk assessment and actions

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

Determine level of exposure		Immediate actions	Actions once risk confirmed
LOW RISK BREACH	• Breaches in PPE that occur below the neck and are managed immediately (e.g., torn glove)	• Remove from situation • Remove PPE • Perform hand hygiene • Inform line manager	Follow actions for low risk as outlined in Table 4: Recommended work permissions and restrictions.
MODERATE RISK BREACH Increased risk of infection	• Incorrect use of PPE • Incorrect PPE for task • Contamination occurs during doffing (occurs above neck)	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Screening/testing • Continuous monitoring	Follow actions for moderate risk as outlined in Table 4: Recommended work permissions and restrictions.
HIGH RISK BREACH Likely risk of infection	• Exposure of mucous membranes by direct droplets from confirmed COVID positive (e.g., spitting in HCW face by confirmed COVID case) • Contamination occurs during doffing	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Closely monitor • Screen/test • Remove from immediate duties	Follow actions for high risk as outlined in Table 4: Recommended work permissions and restrictions.

Table 4: Recommended work permissions and restrictions as determined by risk

Note: This table represents minimum national recommendations, noting that adjustments may be made based the individual assessment (step 1) and consideration of impacts (step 2). Jurisdictions may implement additional requirements above these minimum national recommendations.

	RISK LEVEL			
	LOW RISK	**LOW TO MODERATE RISK**	**MODERATE RISK**	**HIGH RISK**
Work restrictions	Continue to work.	Continue to work.	Isolate until Day 2 RT-PCR test. If test result negative can return to work. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.	**Work restrictions** **Leave workplace immediately**. **Isolate** as a close contact **Potential to return to work early** if Day 5 test result is negative. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.
Testing	Be alert to mild symptoms, test if symptomatic	**Day 2 RT-PCR** test **Day 5 RT-PCR** test.	**Day 2 RT-PCR** test If test result negative may return to work. **Day 5 RT-PCR** test **Day 13 RT-PCR** clearance test.	**Day 2 RT-PCR** test. **Isolate**. **Day 5 RT-PCR** retest. **Isolate while result pending**. **Day 13 RT-PCR** clearance test.
	Any staff who develop symptoms must get a throat-nose swab and **isolate** until their result is known and symptoms have resolved.			
Return to work	N/A	N/A	**Work permissions. If Day 2 test is negative may return to work.** Workplace to consider need for additional surveillance testing; Daily or less frequent saliva testing.	**Work permissions. If Day 2 test and Day 5 test are negative**, may return to work at a single site, with additional surveillance testing; daily saliva tests and; **RT-PCR** retest **day 9 and 13.** Additional: - Be alert to mild symptoms - Test if symptomatic - Limit work to a single site/area.
Additional PPE Requirements on return to work?	**Wear a surgical mask at all times** in indoor spaces including staff only spaces, unless eating/ drinking.	**Wear a surgical mask at all times** in indoor spaces including staff only spaces, unless eating/ drinking. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT PCR test.**
Work across sites?	**In general, Yes**. Inform all employers of cross-site details.	**In general, Yes**. Inform all employers of cross-site details.	**No.** Consider limiting work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work in with vulnerable persons.	**No.** Limit work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work is with vulnerable persons.
	If there is an outbreak at a workplace—i.e. if there is previously demonstrated transmission—even low-risk exposures should limit work to a single site.			
	Workers in COVID Streaming Areas must follow any jurisdiction workplace directions from the Chief Health Officer.			

Appendix E: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew close contacts. For more information on contact tracing of aircraft passengers see Close Contacts- Aircraft passengers and crew.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a close contact:
    - Face-to-face contact with a confirmed case during their infectious period.
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period.
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHUs should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as close contacts.

Additional considerations for conducting a risk assessment should include:

1. **Variants of concern**
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

2. **Proximity of crew to confirmed cases**
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. **Duration of exposure to confirmed cases**
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

4. **Size of the compartment in which the crew and confirmed case interacted**
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered close contacts.

5. **The number of confirmed cases of COVID-19 on board**
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. **Potential breaches of PPE**
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

Aircrew and passengers who are close contacts

If an airline becomes aware of a crew member or passenger who was a close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix F: Guidance on the management of aircrew.

Appendix F: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Aircrew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix G: Full revision history of the COVID-19 SoNG

Revision history

Version	Date	Revised by	Changes
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C

Version	Date	Revised by	Changes
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing

Version	Date	Revised by	Changes
			indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.

Version	Date	Revised by	Changes
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.

Version	Date	Revised by	Changes
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 6.1

15 November 2021

Summary of revision history

For full revision history, please refer to Appendix G

Version	Date	Revised by	Changes
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for COVID-19. Jurisdictions may adapt this guidance based on local epidemiological context.

Updates to this guideline reflect community transmission in some jurisdictions and Australia's progress through the *National Plan to transition Australia's National COVID-19 Response*. Please see Appendix B for additional considerations for jurisdictions with low or no community transmission. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, please refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – initiate public health responses as soon as possible. Public health responses may be automated and prioritised to assist with maintaining public health workforce capacity.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status.

Hospitalised confirmed cases should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of confirmed COVID-19 patients, including personal protective equipment (PPE), see ICEG-endorsed infection control guidance.

Historical cases do not need to isolate and public health units (PHUs) do not need to follow up their contacts.

Contact management

PHUs should manage close contacts according to management of contacts guidance.

Unvaccinated or partially vaccinated close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period. Vaccinated close contacts must quarantine for 7 days following last close contact with the confirmed case during their infectious period. Close contacts should monitor for development of fever or COVID-19 symptoms during this period, where feasible, and test for SARS-CoV-2 if symptoms develop.

2. Key definitions

Low or no community transmission

Low or no community transmission, in this guidance refers to infrequent or no COVID-19 cases acquired within a PHU's geographic area of responsibility.

Community transmission

Community transmission, in this guidance refers to when there are multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction.

Fully vaccinated person

Fully vaccinated refers to a person who is ≥14 days following receipt of the final dose of a primary course of COVID-19 vaccine approved or recognised by the Therapeutic Goods Administration (TGA)[1].

Partially vaccinated person

Partially vaccinated refers to a person who has received at least one dose of a COVID-19 vaccine registered by the TGA but does not meet the definition of a fully vaccinated person.

Reinfection

A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed COVID-19 that is determined to be a separate episode to the first based on epidemiological and/or laboratory findings. SARS-CoV-2 RNA detection must be greater than 90 days after the first laboratory confirmed infection to be considered reinfection. Wherever feasible, whole genome sequencing should be undertaken for suspected reinfections.

Breakthrough infection

A confirmed episode of SARS-CoV-2 infection in a fully vaccinated person > 14 days following their final dose of a primary course of COVID-19 vaccine.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

[1] There may be differing operational definitions of fully vaccinated in jurisdictions and for purposes of international travel.

3. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. In 2021, the SARS-CoV-2 Delta variant became the predominant variant of the virus in Australia.

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (1).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (2). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (2).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings, in the context of certain behaviours, such as singing and shouting (3) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (2). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (4, 5). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (6).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of early SARS-CoV-2 variants ranged from 2–4 (7). R_0 for confined settings were potentially at the higher end of this range. The Delta variant of SARS-Cov-2 is more transmissible than previously identified variants with infectiousness nearly twice that of the historical variant (8).

Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (9, 10).

SARS-CoV-2 variants of concern or interest

During the pandemic, SARS-CoV-2 variants have emerged overseas. Some of these are denoted 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (11, 12). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information please see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

The Communicable Diseases Genomics Network (CDGN) actively monitors variants and their reported mutations to understand how they influence the behaviour of the virus. As variants are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, routes of transmission, disease severity, incubation period, and infectious period. These factors may have implications for public health measures necessary to contain the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see Infection Control Expert Group (ICEG) endorsed infection control guidance.

Incubation period

Prior to the emergence of the Delta variant, the median incubation period for people who became symptomatic was 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (13-15). Around 1% of COVID-19 cases developed symptoms more than 14 days after exposure (16). Evidence for the Delta variant incubation period is still emerging, however some studies suggest it may be shorter than other lineages (17, 18).

There is currently limited evidence to determine how the incubation period for breakthrough infection in vaccinated individuals may differ from infection in unvaccinated individuals.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (19, 20). Pre-symptomatic transmission can occur 1-3 days before symptom onset (21, 22). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (23).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms

(20). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (23). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (24).

It has been demonstrated that the Delta variant is associated with higher viral burden and longer duration of viral shedding compared to previous variants of SARS-CoV-2 (25, 26). Currently available evidence suggests that initial viral load is similar between vaccinated and unvaccinated individuals, however some studies have found that vaccinated people have a more rapid decline in viral load than unvaccinated people (27-29).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the PHU. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (30-32). Other symptoms include headache, sore throat, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (30-33). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (34).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. International cohort studies have suggested unvaccinated or partially vaccinated people infected with the Delta variant are more likely to be hospitalised than patients infected with the Alpha variant (35, 36)

Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (19, 20, 37-40). It is unclear at this stage whether the higher viral burden associated with the Delta variant has changed the proportion of asymptomatic infections.

Fully vaccinated people can still become infected though infection is less likely than in someone who is unvaccinated. Disease associated with breakthrough infection is less severe, however, the risk of onward transmission appears to be similar to that for unvaccinated individuals (41); however the period of infectiousness appears to be shorter in vaccinated cases. Severe disease can still occur in a small proportion of vaccinated people particularly the elderly and those with certain co-morbidities (42, 43).

COVID-19 in children

Acute infection with SARS-CoV-2 is generally associated with mild disease in children, and compared to adults, children have almost 25 times lower risk of severe disease (44, 45). However, however the period of infectiousness appears to be shorter in vaccinated cases. children may be hospitalised for social, rather than clinical, reasons, for example if both parents are too unwell to care for them. A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally

associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (46).

Longer term outcomes of COVID-19

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (47). A large systematic review of the body of evidence collected on the post-acute sequelae of COVID found the median proportion of COVID-19 survivors experiencing at least one sequelae was 54% at 1 month (short-term), 55% at 2 to 5 months (intermediate-term), and 54% at 6 or more months (long-term.) (48, 49). In the UK, prevalence of self-reported post-acute sequelae of COVID-19 has been highest in people aged 35 to 69 years, females, people living in more disadvantaged areas, people working in health or social care, and people with disabilities (50).

Case fatality rate

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.0% (51). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems and patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is less than 1% (based on surveillance data notified in Australia as of 14 November 2021). As of 14 November 2021, 45% (839/1882) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (52).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (52). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (52, 53).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (53). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (53). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Durability of immunity after SARS-CoV-2 infection likely differs significantly from person to person depending upon a range of factors (age, co-morbidities and pre-existing immunosuppression and previous vaccination). Studies suggest a strong immune response after previous infection, with effective natural immunity to future infectious in most individuals (54). However, vaccination continues to provide the best protection against reinfection (55-59).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- Come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including:

- multiple exposure points;
- staff who may have a perceived need to continue work despite being unwell; and
- language barriers for people from culturally and linguistically diverse backgrounds.

Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

4. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and, as much as possible, disease transmission. It is anticipated that high levels of COVID-19 vaccination coverage will facilitate the progressive winding back of public health and social measures such as travel restrictions and physical distancing.

As of October 2021, the Australian Technical Advisory Group on Immunisation (ATAGI) recommends vaccination for all individuals aged 12 years and over in a two-dose vaccine schedule (3 doses for severely immunocompromised individuals). ATAGI supports the use of a single booster dose for people who completed their primary COVID-19 vaccine course ≥6 months ago. This will initially include, but not be limited to, groups who were prioritised in the rollout of the vaccine program from early 2021. For more information, please see ATAGI recommendations on the use of a booster dose of COVID-19 vaccine.

The COVID-19 vaccines registered for use in Australia have all been shown to be highly effective against severe disease, including due to the Delta variant (60). Vaccine effectiveness against hospitalisation due to Delta infection has been shown to be 95.2% and 98.4% for Vaxzevaria (AstraZeneca) and Comirnaty (Pfizer), respectively, 2 to 9 weeks following the second dose (60). The effectiveness of these two vaccines against death has been shown to be 94.1% and 98.2%, respectively (60). Existing vaccine safety monitoring systems have been strengthened, with weekly COVID-19 vaccine safety reports provided by the Therapeutic Goods Administration and AusVaxSafety active surveillance system.

Other prevention activities

When combined, prevention and control activities, can help limit the spread of certain respiratory diseases, including COVID-19. These measures may include:

1. Physical distancing and gathering
    - Physical distancing can reduce the potential for transmission. Physical distancing measures may include:
        - maintaining a distance of 1.5m from people
        - density restrictions; and
        - limits on the number of people allowed to participate in an event.
2. Environmental controls, such as optimised ventilation

3. Personal hygiene
    - PHUs should encourage good hygiene practices to prevent SARS-CoV-2 infection including:
        - wearing a face mask where physical distancing cannot be maintained, particularly indoors;
        - staying home if unwell;
        - effective hand and respiratory hygiene; and
        - cleaning surfaces
4. Travel restrictions
    - Some jurisdictions will require quarantine or testing of domestic and international travellers. See *COVID-19 FAQs- international travellers to Australia.*

5. Surveillance

There are five main objectives of surveillance for COVID-19, which are to rapidly:

1. Identify, isolate and manage cases.
2. Identify, quarantine and provide relevant information to contacts.
3. Detect and manage clusters and outbreaks.
4. Characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place;
    - describing the transmission dynamics;
    - identifying groups at special risk of infection or more severe disease; and
    - monitoring for SARS-CoV-2 variants.
5. Monitor the effectiveness of the following routine prevention and control activities, in managing the COVID-19 outbreak over time:
    - vaccination;
    - test, trace, isolate and quarantine processes; and
    - public health and social measures.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, vaccination status, place of residence, occupation, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be collected, with additional information being followed up based on risk assessment.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

PHUs should enter initial information on confirmed and historical cases of COVID-19 onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enter enhanced surveillance data shortly after case follow-up. Jurisdictions are encouraged to prioritise and automate as many of these processes as possible, including linking COVID-19 cases to clinical services.

6. Cases

Definitions

Reporting

Notify both confirmed cases and historical cases in the jurisdiction of public health management.

People meeting the confirmed or historical case criteria who were previously diagnosed and managed overseas or in another Australian jurisdiction do not need to be re-notified. In this situation, the person should provide documented evidence of diagnosis overseas or interstate to the PHU.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing;

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[1].

Historical case

The historical case definition intends to capture cases who were infected sometime in the past that were not previously reported and are not considered infectious at the time of diagnosis. Further laboratory testing is required to meet this criterion.

A historical case requires:

i. Laboratory evidence to support a historic infection; **AND**

ii. Absence of clinical evidence in the 14 days prior to swab date of positive test

Laboratory evidence for historic infection:

1. For people who have not been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[2]; **AND**
    - A subsequent PCR is negative OR suggestive of a historical infection[2], taken at least 24 hours apart; **AND**
    - Detection of IgG or total antibody[1];

OR

2. For people who have been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[2]; **AND**
    - A subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence

- Fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[3]; or
- Loss of smell or loss of taste.

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[2] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

[3] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Specimen collection and testing for SARS-CoV-2

Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) or transcription-mediated amplification (TMA) is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection. For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; and different types of SARS-CoV-2 specific testing, see *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Alternative testing methods, including rapid antigen testing for SARS-CoV-2, may be used in specific contexts and settings where pre-test probability is high. See *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests*. PHUs should follow jurisdictional guidance on the use of rapid antigen tests.

See *CDNA and PHLN Testing Framework for COVID-19 in Australia* for guidance on local approaches to testing, including key priority groups based on the likelihood of infection and the epidemiological situation.

Guidance on Personal Protective Equipment (PPE) for specimen collection is available from *ICEG-endorsed infection control guidance*.

Who to test for SARS-CoV-2

It is important to maintain high rates of testing to rapidly detect all infections and identify chains of transmission in the community.

Test the following people:

1. **Symptomatic People**

People who have at least one of the following COVID-19 like symptoms should test for SARS-CoV-2.

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat); or
- Loss of smell or loss of taste.

Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. SARS-CoV-2 testing should be considered when assessing patients presenting with non-specific signs of infection.

2. **Asymptomatic people**

People who have higher risk of exposure to SARS-COV-2 should test for SARS-CoV-2, including:

- Close contacts of COVID-19 cases
- People who provide care for COVID-19 cases (e.g. Health care workers).
- Domestic and international aircrew
- International arrivals
- Workers in managed quarantine facilities

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHUs should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Stay at home requirements after COVID-19 testing

Health care workers providing testing services should clearly communicate the following stay at home requirements after COVID-19 testing:

1. Symptomatic people who have tested for SARS-CoV-2 should stay at home until they receive a negative test, regardless of vaccination status.
2. Asymptomatic people who are not close contacts do not need to stay at home whilst awaiting a negative test result, unless instructed to stay at home by a public health authority.

Please see Management of Contacts for guidance on quarantine and testing of close contacts.

Please see Appendix B for additional post-testing instructions for jurisdictions with low or no community transmission.

Assessing indeterminate and suspected false positive PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and, where required, have procedures in place to confirm test results. Where there is active COVID-19 in the community, the positive predictive value of PCR testing is very high (with the exception of persistent shedding). However, indeterminate or suspected false positive SARS-CoV-2 test results may still occur. PHUs may assess indeterminate or suspected false positive PCR results in order to avoid unnecessary isolation of cases, quarantine of contacts, and strain on public health resources.

Indeterminate or inconclusive PCR results

Indeterminate results may occur due to low viral loads; persistent shedding; or non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should contact the laboratory microbiologist to discuss the results and decide whether further testing is required. Consider results in the context of the clinical and epidemiological circumstances to inform whether further public health action is required.

PHUs can use the below actions for suspected false positive PCR results to determine whether to manage the person with indeterminate PCR results as a COVID-19 case.

Suspected false positive PCR results

PHUs might suspect a false positive SARS-CoV-2 PCR result when there are no epidemiological risk factors for COVID-19. This is particularly relevant for jurisdictions with low or no community transmission with high levels of enhanced testing.

If a false positive PCR result is suspected, PHUs should contact the laboratory microbiologist to obtain more details of the PCR test results before designating the result a false positive. The laboratory microbiologist will investigate whether there is evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required. If further laboratory investigations provide convincing evidence the case is negative, the test may be considered a false positive and the laboratory will issue an amended report.

For more information on the possible sources of false positive PCR test results, see *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

Further PHU actions for suspected false positive PCR results

PHUs should conduct further assessments (in close collaboration with the laboratory microbiologist and treating clinician) for suspected false positive results.

Consider a case conference with experienced public health practitioners, the microbiologist and the treating clinician. In some jurisdictions, there may already be established panels for this purpose. Where there is uncertainty or difficulty reaching agreement on whether the PCR is a false positive, assess the risks associated with missing a true COVID-19 case.

PHUs should:

1. Continue all relevant public health action, including case isolation and contact tracing, until the test is determined to be a false positive.
2. Thoroughly review the case's clinical history (including for mild/atypical symptoms, delayed onset of symptoms, history of compatible illness) and potential epidemiological links. Consider the likelihood of true asymptomatic infection, pre-symptomatic infection, mildly symptomatic infection, and previous infection with persistent viral shedding.
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider testing close contacts, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
5. Record the results of the investigation, including relevant laboratory information following discussion with the microbiologist, into a standard report.

PHUs can cease all public health interventions once a PCR result is confidently considered false positive. If the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed cases:

Begin follow up investigation of confirmed cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Complete case interviews, exposure site identification and close contact identification within 1 day of notification of a confirmed case. Jurisdictions may choose to prioritise cases for follow up and automate many of these case management processes.

PHUs should ensure that staff are available to contribute to the expert assessment of patients under investigation on hospital clinician or general practitioner request.

Historical cases:

Confirmed historical cases do not need to isolate and PHUs do not need to follow up their contacts.

Response procedure

Genome sequencing for all cases

Where possible, whole genome sequencing of COVID-19 cases in Australia should be prioritised for all new cases (overseas and locally acquired). Laboratories across Australia are routinely monitoring sequences for variants. Rapid identification of cases infected with a SARS-CoV-2 variant of concern enables cases to be managed with additional precautions to mitigate risk to the public (see release from isolation criteria). Public health authorities should work with the CDGN to ensure timely reporting of genomics to AusTrakka, where feasible.

While all positive SARS-CoV-2 samples should undergo whole genome sequencing, whole genome sequencing is not always successful, particularly when there is not enough virus present in the specimen. If a specimen is unable to be sequenced and the case has no

clear epidemiological link to another confirmed case, repeat sample collection should be attempted to try to identify infection with variant of concern. This is particularly important to inform how a PHU will manage the case (e.g. when they can be released from isolation/hotel quarantine).

When whole genome sequencing cannot be done or where a confirmed case is infected with an unknown SARS-CoV-2 variant, it may be appropriate for PHUs to take a precautionary approach and manage the case as if they were infected with a SARS-CoV-2 variant of concern (e.g. cases who are international travellers who have transited through hub airports or who have spent time in a country where variants of concern are prevalent). This also includes confirmed cases where the strain identity cannot be confirmed by sequencing and who do not have a clear epidemiological link to another confirmed case infected with a strain that is not a SARS-CoV-2 variant of concern. Please see Release from Isolation for more information.

Case investigation

Ideally, PHUs should respond to COVID-19 case notifications as soon as possible via a case interview. However, where public health capacity is exceeded, PHUs may choose to automate and prioritise case investigation processes (e.g. SMS based questionnaires). PHUs can use Appendix A- COVID-19 PHU checklist and their state or territory COVID-19 case report as a guide for case investigation.

PHUs should ensure the following actions have taken place for each case:

- Isolate the case and confirm their last day in community
- Confirm any symptoms of the illness and the symptom onset date
- Confirm relevant pathology test results and any additional tests required, including repeat tests where relevant.
- Record vaccination status including vaccine type, dosage, date and country of administration.
- Review both case and contact management.
- Commence or complete contact tracing, aiming to place close contacts in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Where possible, identify the likely source of infection.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. For further advice on clinical management, please see:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Prophylaxis against severe disease:

Proactive use of monoclonal antibody therapy in people at high risk of developing severe disease may help prevent hospitalisation if it is administered within the first five days of developing symptoms. PHUs, in conjunction with the local clinical team, can help identify cases for clinical treatment early. For further information on emerging clinical treatments, please see *National COVID-19 Clinical Evidence Taskforce*.

Education

PHUs should educate cases about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Hospitalised COVID-19 patients

To minimise the risk of transmission from hospitalised COVID-19 patients, PHUs should encourage hospitals to undertake a system based risk assessment. Hospitals can manage risk by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Hospitalised confirmed cases should be isolate in a negative pressure room with anteroom, where available. If a negative pressure room is not available, the hospitalised case can isolate in a standard isolation room or single room with negative airflow as an alternative. Avoid rooms with positive pressure airflow.

If there is concern about a potential exposure related to a hospitalised case, PHUs should undertake a risk assessment on hospital staff, visitors or other patients to determine whether further public health response is required (See Appendix D).

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital (see above), at home, or other community residential settings identified by the PHU. Cases can isolate at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- it can be assured that the home environment permits separation of the case from other household members;

- the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- there is a reasonable level of confidence of the compliance of the case.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another pathogen.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, testing for other respiratory pathogens should be performed.

PHUs should use the following criteria to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHUs and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. PCR results

suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms that do not report Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Release from isolation criteria for all confirmed cases who do not meet historical infection criteria

The following information details release from isolation criteria for confirmed cases. This includes confirmed cases infected with a SARS-CoV-2 variant of concern.

Laboratory based evidence suggests that people infected with the Delta variant have higher viral loads which remain high for a longer period of time than people infected with other known variants. There is a very small risk that a person infected with the Delta variant may still be infectious despite meeting release from isolation criteria listed below (Unpublished data). However, this very low risk does not justify extension of the release from isolation period beyond 14 days, nor justify a requirement for PCR testing prior to release for all cases (see Release from isolation and high-risk settings)

Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2 or 3 – whichever is applicable. Significantly immunocompromised cases will also need to meet additional criterion in point 4 in order to be released from isolation.

1. Confirmed cases who have remained asymptomatic

Fully vaccinated case	Unvaccinated/ partially vaccinated case or unknown vaccination status
The case can be released from isolation if: • at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed during this period. Some jurisdictions may support earlier release if: • at least 7 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed; and • PCR is negative at day 7 from specimen collection date.	The case can be released from isolation if: • at least 14 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed during this period. Some jurisdictions may support earlier release if: • at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed; and • PCR is negative at day 10 from specimen collection date.

2. *Confirmed cases with resolution of fever and substantial improvement of respiratory symptoms*

Fully vaccinated case	Unvaccinated/ partially vaccinated case or unknown vaccination status
The case can be released from isolation if: • at least 10 days have passed since symptom onset; and • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]. Some jurisdictions may support earlier release if: • at least 7 days have passed since symptom onset; and • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]; and • PCR is negative at day 7 from symptom onset.	The case can be released from isolation if: • at least 14 days have passed since symptom onset; and • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]. Some jurisdictions may support earlier release if: • at least 10 days have passed since symptom onset; and • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]; and • PCR is negative at day 10 from symptom onset.

3. *Confirmed cases without complete resolution of acute respiratory symptoms*

Fully vaccinated case	Unvaccinated/ partially vaccinated case or unknown vaccination status
The case can be released from isolation if they meet **all** of the following criteria: • at least 14 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • the case is not significantly immunocompromised[3] OR	The case can be released from isolation if they meet **all** of the following criteria: • at least 20 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • the case is not significantly immunocompromised[3] OR

The case can also be released from isolation if they meet **all** the following criteria: • at least 10 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 7 from symptom onset.	The case can also be released from isolation if they meet **all** the following criteria: • at least 14 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 10 from symptom onset.

4. Significantly immunocompromised persons

In addition to meeting the appropriate criteria described in points 1 or 2 above, confirmed cases who are significantly immunocompromised[3] must meet a higher standard requiring additional assessment.

Regardless of vaccination status, COVID-19 cases who are immunocompromised can be released from isolation when they meet the following additional criterion:

- PCR negative[2] on at least two consecutive respiratory specimens collected at least 24 hours apart after day 7 from symptom onset[4].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). PHUs should discuss this with the treating medical practitioner and the testing laboratory.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count

below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Testing after release from isolation

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case has not re-developed COVID-19 symptoms but is swabbed and tests positive after they have met the above release from isolation criteria, then the case does not require re-isolation. Current evidence and Australian public health experience indicates these people are unlikely to be infectious.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness consistent with a historic infection, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Release from isolation and high-risk settings

Cases returning to a high-risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

However, there is some laboratory based evidence that a small proportion of people with a Delta variant infection may still be infectious despite fulfilling the appropriate criteria above. Some jurisdictions with low or no community transmission may require additional criteria or measures for cases who will be released back to high-risk settings.

Note: Hospitalised patients who are being transferred to another ward or hospital should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non COVID-19 related condition.

Release from isolation and re-exposure

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the re-exposure was less than 6 months since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic).

Recovered cases, unless immunocompromised, can continue to attend high-risk settings and do not need to be furloughed from work if re-exposed during this 6 month period.

For recovered cases re-exposed after 6 months from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist and/or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be re-tested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Release from isolation and gastrointestinal symptoms

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. Cases who have persistently positive faecal samples test results after meeting release from isolation criteria, may need to follow further precautions or exclusions on a case-by-case basis:

- All cases with diarrhoea should not prepare/ food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. health care workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. People who remain persistently PCR positive in faecal samples use soap and water or alcohol-based sanitiser for hand hygiene. PHUs should provide education emphasising the importance of proper hand hygiene to all cases upon release from isolation.

7. Contacts

Close contact definition

The aim of contact tracing is to interrupt transmission of SARS-CoV-2 through identification and quarantining of people in contact with infectious cases. PHUs can use the below close contact criteria to identify and prioritise people who may have been exposed and potentially incubating the disease.

In jurisdictions with community transmission, where public health workforce capacity is exceeded, PHUs should focus contact tracing efforts on higher risk close contacts in households or settings at highest risk of extensive transmission.

Close contact priority	Contact made during the case's infectious period
Higher risk close contact	A person who has had at least 15 minutes face to face contact with a COVID-19 case and there is reasonable risk of transmission including: • Household contacts • Social contacts with extensive interaction with the case • Contacts in settings at highest risk for extensive transmission or severe outcomes of infection (e.g. Abattoirs, hospitals, accommodation facilities for vulnerable people)
Lower risk close contact	A person who has had less than 15 minutes face to face contact with a COVID-19 case and there is some risk of transmission based on: • vaccination status of both case and contact; • PPE use of both case and contact (e.g. mask type, see Appendix D for health care settings) • the setting (e.g. indoors vs outdoors, size of room, adequacy of ventilation); • the specific variant of SARS-CoV-2; and • the nature of the exposure (e.g. whether shouting or singing).

It is difficult to prescribe a minimum duration of contact that results in infection, as even fleeting personal interactions can result in infection with SARS-CoV-2. The definitions of close contacts listed above represent prioritisation based on risk of infection in a setting where some COVID-19 transmission is acceptable in the community.

Some jurisdictions have developed risk matrices for classification of close contacts in certain settings (e.g. for schools, workplaces). The rationale for risk assessment guidance is to balance COVID-19 transmission risk with the risk of furloughing staff to the extent that the business becomes non-operational. Such guidance will take account of specific risk mitigations within the operation of the business.

For additional considerations for identification of contacts in jurisdictions with low or no community transmission see Appendix B.

Note that:

- For contact tracing, the infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).
- If the case is asymptomatic, the infectious period is the period extending from 48 hours before the initial positive test until the case is classified as no longer infections (refer to Release from isolation).
- For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, please see Appendix D.

Management of contacts

PHUs should assess all persons identified as having had contact with a confirmed case to determine if they should be managed as a close contact. Where possible, PHUs should collect demographic and epidemiological data. Jurisdictions are encouraged to automate contact management processes where feasible.

Quarantine and restriction of close contacts

Where feasible, PHUs should ensure careful selection of a contact's site of quarantine to prevent transmission to others. Some residences may not be feasible if the person cannot quarantine away from other house members (e.g. small apartments, dwellings with multiple generations of family members).

The precautionary advice in this guideline uses an incubation period upper range of 14 days to guide public health measures such as quarantine. However jurisdictions may wish to consider alternate options for quarantine, including a possible mixed model approach (shorter quarantine followed by a time period of less stringent restrictions) based on local risk assessment.

Close contacts who have recovered from COVID-19 do not need to quarantine if:

- they remain asymptomatic;
- they are not immunocompromised; and
- re-exposure is less than 6 months since symptom onset (see Release from isolation and re-exposure).

In jurisdictions with community transmission, where public health workforce capacity is exceeded, PHUs should focus close contact management efforts on higher risk close contacts. Some jurisdictions may choose to have less active management of lower risk close contacts.

PHUs should advise close contacts to:

1. Monitor their health.
    - PHUs should provide advice on the processes for seeking medical care, including how to safely seek COVID-19 testing if symptoms develop. Refer to Medical care for quarantined individuals.
    - Resourcing permitting, PHUs may conduct active monitoring of close contacts for COVID-19 symptoms for 14 days after last possible contact with a confirmed COVID-19 case. This may include via daily SMS follow up.

2. Quarantine for a specified period following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for the specified minimum period regardless of any negative test result (see below).
3. Get tested during the quarantine period (see below table).

Quarantine and testing requirements for close contacts

Fully vaccinated close contacts	Unvaccinated/partially vaccinated close contacts or unknown vaccination status
Quarantine requirements • At a minimum, fully vaccinated close contacts should quarantine for 7 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. • Quarantine must occur for 7 days regardless of any negative test result. **Testing during quarantine** • Testing of close contacts should occur: ○ If COVID-19 symptoms develop ○ On entry to quarantine ○ Before exit from quarantine - A test late in the quarantine period (e.g. after day 5-post exposure), should be conducted. - In some circumstances, PHUs may also consider the need for extension of quarantine if a close contact refuses to undergo exit testing. • If laboratory testing systems are under strain, PHUs may consider not testing close contacts (particularly household contacts) who develop symptoms, and instead considering them probable cases if they develop symptoms. **Other measures** • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house. • Jurisdictions with low or no community transmission may implement more conservative approaches.	**Quarantine requirements** • At a minimum, unvaccinated or partially vaccinated close contacts should quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. • Quarantine must occur for 14 days regardless of any negative test result. **Testing during quarantine** • Testing of close contacts should occur: ○ If COVID-19 symptoms develop ○ On entry to quarantine ○ Before exit from quarantine - A test late in the quarantine period (e.g. day 12-13), should be conducted. - In some circumstances, PHUs may also consider the need for extension of quarantine if a close contact refuses to undergo exit testing. ○ Mid-quarantine (where appropriate) - If there is reason to doubt compliance with quarantine or high risk of the close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies are useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix C: Outbreak investigation and management).

Health and residential care workers

For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, please see Appendix D.

Aircraft passengers and crew

Passengers

At a minimum, PHUs should classify aircraft passengers seated in the same row or two rows in front or behind a confirmed COVID-19 case during the case's infectious period as close contacts. PHUs in jurisdictions with low or no community transmission may classify all passengers on board the flight as close contacts. PHUs can use similar criteria for people who have had close contact on bus or train trips.

Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport.

Risk assessment and management of aircrew

For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify aircrew close contacts. Refer to Appendix E and Appendix F for further information.

Quarantine and essential workers

Close contacts who are essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, PHUs should conduct an individual risk assessment to identify if some essential workers can be permitted to maintain normal work patterns while in quarantine.

This should only occur in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If permitted to maintain normal work patterns, the essential worker must practise vigilant physical distancing and hand and respiratory hygiene, and wear a mask whilst at work. They should adhere to normal quarantine restrictions when outside of essential work activities.

Medical care for quarantined individuals

PHUs should advise close contacts that if they require medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department and advise them of their close contact status before presenting. Close contacts with severe symptoms should call 000 and clearly communicate to the emergency services operator that they are a close contact. Close contacts should wear a mask before presenting to any health care setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with COVID-19 develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by the PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

8. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

9. Special situations

Use of COVID-19 vaccination in outbreak situations

During COVID-19 outbreaks[1], targeted vaccination of identified, unvaccinated individuals at risk of exposure can supplement existing public health interventions. Examples of groups where targeted vaccination may occur include: individuals in closed populations, population groups with low vaccine coverage, or groups that are at higher risk of severe outcomes.

PHUs can use COVID-19 vaccination for two purposes in the context of an outbreak:

1. As an outbreak management strategy to reduce the number and severity of COVID-19 cases in an outbreak, where there is likely to be an ongoing risk of exposure.
2. To opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

COVID-19 vaccination in outbreak management

There is no evidence to support the use of COVID-19 vaccination in first generation close contacts for the purpose of post-exposure prophylaxis. It takes around 14 days for a protective effect to be seen following the first dose of the Pfizer, AstraZeneca and Moderna vaccines (61)s. Vaccination as an outbreak response tool is likely to be of highest utility in closed settings and where there is an ongoing risk of exposure which may cause multiple chains of transmission, such as residential aged care facilities or correctional facilities. In this context, vaccination may be considered for unvaccinated individuals with the goals of:

- Direct protection against severe outcomes and death in vaccinated people.
- Limiting outbreak size and duration by reducing the risk of onward transmission, and thereby reducing morbidity/mortality/demand on clinical and public health resources.

Decision-making around the use of COVID-19 vaccines during outbreaks should consider:

- The location, outbreak context, local epidemiology and likelihood of ongoing risk of exposure (beyond 14 days following vaccination) must be considered in the development of an outbreak vaccination strategy.
- The target population for vaccination should be clearly defined.
- Where there is constrained vaccine supply, priority should be given to those:
    - who have not yet received a first dose of vaccine.
    - at risk of severe outcomes or in whom non-pharmaceutical interventions are not possible (such as those unable to physically distance).
    - at highest risk of transmission of SARS-CoV-2.
- Evaluation should be undertaken after the conclusion of the outbreak.

Opportunistic vaccination

In geographic areas where an outbreak is occurring, opportunistic vaccination of eligible groups may be used to improve vaccination coverage in the population. Outbreaks present an opportunity to promote the benefits of COVID-19 vaccination to the broader community.

Note:

1 For the purposes of vaccination during outbreaks, an outbreak is defined as a single confirmed case of COVID-19 in the community. Individual jurisdictions' outbreak definitions may differ

International travellers

Quarantine requirements for international travellers entering Australia are different for fully vaccinated versus partially or unvaccinated arrivals. It is important to note that the definition of fully vaccinated for international travel purposes differs to the definition included in this guidance. For more information about vaccination and international travel, pre-flight testing and travel requirements, please see *International travel and COVID-19* and *Coronavirus (COVID-19) FAQs – international travellers to Australia*.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

If a confirmed case has attended the workplace while infectious, PHUs can assist workplaces to conduct a risk assessment of potential workplace transmission. This includes assisting workplaces in the identification of workers who have had close contact with the infected worker. PHUs should provide workplaces with a general framework to help with internal risk assessment. In settings with high vaccine coverages, PHUs may take a more considered approach to risk assessment to ensure that economic and social costs are minimised. For more information, see *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

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11. Appendices

Appendix A: Public health unit checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case; and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to High-risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection and follow the cross-border protocol for notifying cases to other jurisdictions as appropriate.

Consider need for media release and designate a media spokesperson.

Appendix B: Additional considerations for jurisdictions with low or no community transmission

This appendix provides additional testing and contact management considerations for PHUs in jurisdictions with low or no community transmission. PHUs in jurisdictions with low or no community transmission may decide to trace and manage casual and secondary close contacts.

As jurisdictions move towards a context of community transmission, and public health capacity is exceeded, PHUs may discontinue using this additional guidance.

Additional testing considerations

In jurisdictions with low or no community transmission, individuals meeting the suspect case definition may be tested for SARS-CoV-2.

Jurisdictions with low or no community transmission may also conduct additional testing for screening purposes, for example in COVID-19 quarantine and isolation facilities and workers in health care settings.

Applying a suspect case definition

In jurisdictions with low or no community transmission, PHUs can use the suspect case definition to identify those who may have an increased likelihood of current SARS-CoV-2 and where having such a definition may continue to have public health utility.

Suspect cases may require specific infection prevention and control measures and public health management. Suspect cases do not need to be notified to the NNDSS.

A suspect case is a person who meets the below **clinical** and **epidemiological** criteria.

Clinical evidence (in the past 14 days):

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[1]; or
- Loss of smell or loss of taste.

Epidemiological evidence (in the past 14 days):

- Close contact with a confirmed case
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services
- International air, maritime and border staff
- Health care workers with potential COVID-19 patient contact
- People who have been in areas with COVID-19 community transmission

Notes:

[1] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Management of suspect cases

PHUs may consider undertaking case interviews, exposure site identification and close contact identification for suspect cases. PHUs may undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and there remains high suspicion that the person has COVID-19, PHUs may support continued isolation and use of relevant infection prevention and control precautions, whilst awaiting further testing and re-assessment (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*.

Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. See Post-testing instructions and isolation requirements for suspect cases and enhanced testing.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions with low or no community transmission may conduct routine testing of international travellers who are in hotel quarantine. Testing may occur on day 0–2 and then on day 12-14, preferably as late as possible, of hotel quarantine. Some jurisdictions may undertake mid-quarantine testing for earlier identification of cases and require confirmation of exit testing prior to release from quarantine. Some jurisdictions may also require further testing after the traveller has left managed quarantine.

Exact arrangements for post-quarantine testing depend on state and territory protocols.

COVID-19 quarantine and isolation facility workers

Some jurisdictions may require COVID-19 quarantine and isolation facility workers to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may implement additional requirements for quarantine workers. See Australian Health Protection Principal Committee (AHPPC) statement on National Principles for Managed Quarantine.

Testing in health care settings

Jurisdictions with low or no community transmission may request routine testing of staff in health care settings, in addition to other control strategies. Periodic and comprehensive screening of staff in health care settings can assist in earlier identification of infection in health care environments.

Routine testing of staff in health care settings is recommended on a voluntary basis. However, jurisdictions may determine the triggers for when routine testing is implemented and implement mandatory testing in certain high-risk situations. Jurisdictions may determine

the appropriate frequency and method for routine testing, depending on the specific circumstances.

Considered routine testing for health care setting staff who:

- directly care for COVID-19 patients
- work at COVID-19 testing sites
- provide occasional or intermittent care to COVID-19 patients (e.g. medical consulting units, pharmacists, allied health)
- work within the patient/client/resident zone for COVID-19 patients (e.g. ward clerks, cleaners, pharmacy deliveries, food delivery)
- transport a COVID-19 patient to a health care setting work in high risk areas of the hospital that don't have confirmed cases (e.g. staff in emergency departments)
- work in community health centres (e.g. GP led respiratory or fever clinics)

Provided they do not have COVID-19 symptoms and are not a close contact, staff in health care settings who undergo routine testing are not required to isolate whilst awaiting a negative result and may continue to work.

If staff are away from work for 7 days or more, they may be requested to undertake a COVID-19 test with oropharyngeal and deep nasal or nasopharyngeal swabs. E.g. Every 7 days while away until 14 days have passed since they were last at work.

Jurisdictions may also need to consider testing requirements for staff:

- working across wards or campuses
- working between hospitals/jobs
- who are inpatients or outpatients
- visiting high-risk settings such as hospitals or aged care facilities

The need for routine testing in these circumstances should be assessed case-by-case, giving consideration to the associated level of risk.

Post-testing instructions and isolation requirements for suspect cases

The following post-testing instructions apply for suspect cases and individuals who have undergone enhanced testing in jurisdictions with low or no community transmission.

1. Symptomatic people who are not contacts of a confirmed case should stay at home until they receive a negative test AND their symptoms resolve, regardless of vaccination status.
2. Symptomatic people who have tested for SARS-CoV-2 and are contacts of a confirmed case should stay at home or remain in quarantine for the period set by the PHU, regardless of negative test result.

Please see Additional contact management considerations for guidance on quarantine and testing of contacts in jurisdictions with low or no community transmission.

If the test results come back positive – see Case management.

Additional contact management considerations

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. In low or no community transmission settings, where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) may be undertaken. This is particularly important when the public health aim is to identify all potential unrecognised chains of transmission and the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing may be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. PHUs may consider following up any person who in that period who had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts may be screened for possible symptoms and be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing may be considered for potential source contacts who are unvaccinated and asymptomatic (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive via PCR or (for unvaccinated individuals) a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain. Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Alternative primary close contact definition

In jurisdictions with low or no community transmission, PHUs may use the following expanded definition of a primary close contact, as a precautionary measure (resourcing permitting).

A primary close contact is defined as a person who has:

- had face-to-face contact with a confirmed case during their infectious period; or
- shared a closed space with a confirmed case during their infectious period, where there is reasonable risk of transmission based on a risk assessment performed by the PHU, taking into account:
    - transmission having been proven to have readily occurred in this (or a similar) setting;
    - the specific variant of SARS-CoV-2;
    - the adequacy of air exchange in an indoor environment; or
    - the nature of the exposure (e.g. type of contact, mask use, whether shouting or singing, size of venue etc.).

Note that:

- The infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered, at the discretion of the PHU.

Alternative management of primary close contacts

PHUs in jurisdictions with low or no community transmission may request primary close contacts to do the following actions, regardless of vaccination status:

- Quarantine for 14 days following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- Monitor their health. PHUs may conduct active daily monitoring of primary close contacts for COVID-19 symptoms for 14 days after the last possible contact with a confirmed COVID-19 case. This includes SMS contact.
- Get tested during the quarantine period (see below).

Advise primary close contacts on the processes for seeking medical care, including how to safely seek COVID-19 testing if they develop symptoms. Refer to Medical care for quarantined individuals.

In jurisdictions with low or no community transmission, testing of primary close contacts may occur:

1. If COVID-19 symptoms develop
2. On entry to quarantine
    - A positive test result would make the primary close contact a case and support an earlier decision to move the person to an alternative place for isolation and bring forward contact tracing for that person.
3. Before exit from quarantine

- A positive test result late in the quarantine period (e.g. day 10–13), prevents the release of potentially infectious people into the community.
- In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

4. Mid-quarantine (where appropriate)
    - If there is reason to doubt compliance with quarantine or high risk of the primary close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Identification of casual contacts

In jurisdictions with low or no community transmission, and at the discretion of the PHU, there is likely to be some utility in following up casual contacts in addition to close contact as a precautionary measure (resourcing permitting).

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a close contact.

In jurisdictions with low or no community transmission, and at the discretion of the PHU, some casual contacts may be reclassified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to individuals who do not meet the close contact definition.

The following factors may be considered prior to reclassifying casual contacts as primary close contacts:

- Epidemiological context, including level of community transmission.
- The specific variant of SARS-CoV-2.
- The potential for large scale amplification in the given setting or venue
- Jurisdictional capacity and resourcing requirements, including opportunity costs of managing them as close contacts
- Feasibility and resulting impacts of public health measures on essential services (e.g. provision of health care services)
- Vulnerability of the contacts.

Depending on the above factors, PHUs may implement a range of options for management of casual contacts in different settings.

Management of casual contacts

Quarantine and testing requirements for casual contacts

Fully vaccinated casual contacts	Unvaccinated or partially vaccinated casual contacts
1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events) • At a minimum, fully vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required. **2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • Casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.	**1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events)** • At a minimum, unvaccinated or partially vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required. **2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • Unvaccinated or partially vaccinated casual contacts may be requested to enter into quarantine, depending on the local epidemiology. If quarantine is indicated, a shorter term quarantine until around 5 days after exposure is appropriate. • They should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • If quarantined, the unvaccinated casual contact may exit quarantine once a negative day 4-6 PCR result is returned. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.

Note: For guidance on management of casual contacts who are workers in healthcare settings, please see Appendix D.

Identification of secondary close contacts

In jurisdictions with low or no community transmission, and at the discretion of the PHU, there may be some utility in following up secondary close contacts as a precautionary measure (resourcing permitting).

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact or shared a closed space in any setting with a primary close contact of a COVID-19 case, from 24 hours after the primary contact's exposure to the case.

Identification of secondary close contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Management of secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHUs may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. lives with the case, exposed at a high-risk setting where transmission has already occurred);
- The secondary close contact is unable to remain isolated from the primary close contact (e.g. one is a carer for the other or lives in the same household);
- There will be a delay in confirming the initial case or commencing contact tracing;
- Secondary transmission has already occurred from a primary close contact to a secondary close contact;
- There are communication challenges with close contacts; or
- The consequences of the secondary case being positive is deemed very high risk (e.g. returning to a remote community).

Secondary close contacts may be quarantined until the PHU has confirmed that the primary close contact was not infectious at the time of last contact with the secondary close contact.

Household secondary close contacts

PHUs may require household secondary close contacts to quarantine until the primary close contact is cleared from quarantine.

Non-household secondary close contacts

PHUs may require secondary close contacts who are in a different household to the primary close contact to remain in quarantine until 14 days from the last exposure of the primary close contact to the confirmed case.

Alternatively, PHUs may require these secondary close contacts to remain in quarantine until there is confirmation that the primary close contact was not infectious at the last time of contact with the secondary close contact (e.g. if the primary close contact tests negative).

Appendix C: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHUs should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHUs are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHUs should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHUs should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be close contacts. These include, staff, residents (if relevant) and visitors.

PHUs may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHUs should ensure all close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHUs may also require secondary close contacts or casual contacts to quarantine.

I. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

I. Assess and record vaccination status

During outbreak investigations, it is important for PHUs to assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities*. While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.

Detailed information on environmental cleaning and disinfection in health and residential care settings is in the *COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet*. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a) With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b) In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c) Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort on Retest Day/s**
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHUs should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix D: Work Permissions and Restrictions Framework for Workers in Health Care Settings

This framework supports safe decision making when determining whether to place work permissions/restrictions, independent of quarantine, on a worker after a COVID-19 exposure in a health care setting in the context of an outbreak and community transmission of COVID-19.

Workers in health care settings include a broad array of workers including public, private, and primary care health settings. This includes workers in:

- Public health settings (e.g. public hospitals, public health clinics, ambulance services, and patient transport services)
- Private health settings (e.g. private hospital, day procedure centre or specialist outpatient services)
- Private provider facilities (e.g. general practitioners, private nurse offices, community pharmacies, consulting offices)
- Education settings in which health care students are managed to undertake placement, registration and/or internships in clinical settings

This also includes disability care workers and residential care workers, and associated students within these settings.

Health care services should apply a broad hierarchy of control framework to minimise and manage the risk of transmission of COVID-19. A system-based risk managed approach that applies appropriate mitigations reduces the risk of exposure in health care settings. However, it is acknowledged that risk cannot be eliminated and that exposures will occur.

Health services, supported by the local PHU, are responsible for considering when work permissions and restrictions are required. Health Services and Jurisdictional Departments of Health are also responsible for operationalising these guidelines including defining the reporting and escalation requirements (e.g., if multiple health services are involved) internally.

Work permissions and restrictions framework (the Framework)

The Framework provides a process and tools to support exposure assessment, work restriction and return to work decision making for workers in health care settings. The Framework is designed for workers in health care settings who have had an individual risk assessment completed after exposure to suspect or known COVID-19 case within a health care setting.

Health care managers are encouraged to be familiar with the Framework and additional jurisdictional requirements. Where possible, identify appropriate contacts to be involved in assessment teams in advance and consider training in relation to the Framework. Consider locally applying a process of monitoring and evaluation, in line with jurisdictional requirements.

The Framework includes three steps:

1. Undertake an individual risk assessment for workers in health care settings after potential exposure to a suspect or known COVID-19 case within the health care setting.
    - Assessment is conducted by appropriately trained and skilled local teams from health service providers and residential care facilities (including disability services) in collaboration with the PHU and other specialties where available and required (e.g. Infection Prevention and Control (IPC) Units, Work Health and Safety Units, Infectious Diseases Physicians).
    - Consultation should include hospital and health service operational managers, where relevant, to provide guidance on staff dynamics, workplace layouts, staffing pressure and other factors as required
    - Tools to assist the assessment at this stage are available at:
        - Table 1 – Workers in health care settings exposure risk matrix for workers who are fully vaccinated for COVID-19
        - Table 2 – Workers in health care settings exposure risk matrix for workers who are unvaccinated or partially vaccinated for COVID-19
        - Table 3 – Personal Protective Equipment (PPE) breach risk assessment and actions
2. Determine the potential impacts of work restrictions on the safe ongoing management of the health service.
3. Once exposure risk is determined in the context of the facility and work impacts, refer to the recommended work permissions and mitigations action matrix.
    - Tools to assist the assessment at this stage are available at:
        - Table 4 – Recommended work restrictions and permissions as determined by risk.

Once these steps have been completed, the health service should work with the worker and supervisor to implement appropriate actions. These actions should be in line with public health policy and directives from the Chief Health Officer. Where final actions deviate from the recommended work restrictions and permissions (Table 4), this must be approved by the relevant delegate or Chief Health Officer.

Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review a worker in a health care setting's work restrictions and permissions to facilitate continuation of essential health services.

STEP 1: Undertake an individual risk assessment of affected workers in health care settings and determine level of exposure

Factors to be considered when undertaking an individual risk assessment are:

Details of exposure event (type, dose, time):

- Case details (infectious period, transmission risk, behaviour's, vaccination status, information on viral load (CT values) if available)

- Type of exposure: types of care or potential behaviours that increase the risk of COVID-19 transmission
- Details of related transmission events in the outbreak
- Amount of cumulative time the worker has occupied the same shared space as the case including type and proximity
- Vaccination status: unvaccinated, partially vaccinated, fully vaccinated
- Staff mobility: Work across multiple facilities highly mobile within the facility, work in high-risk area.

Details of mitigations in place:

- Vaccination status of the worker (unvaccinated/ partially vaccinated/ fully vaccinated)
- PPE and IPC: correct use of appropriate PPE and IPC precautions by the case and worker

Risk assessments should be made on a case-by-case basis by local health service staff in consultation with the PHU and other relevant staff. In most circumstances, exposure risk should be determined using the appropriate health care worker exposure matrix based on vaccination status (Table 1 for fully vaccinated OR Table 2 for partial or unvaccinated).

In some circumstances, the exposure matrices provide an option of moderate or high risk, to reflect that a qualitative assessment is required to determine the appropriate level of exposure. In other circumstances, the matrix provides a clear indication of the exposure risk, however this remains subject to a case-by-case assessment. For example, in circumstances where the worker in a health care setting is immune-compromised, it may be necessary to increase the risk profile (e.g., a fully vaccinated worker may be assessed using the unvaccinated risk matrix).

Final decisions should be informed by a qualitative assessment considering variety of factors, as outlined in Steps 2 and 3. Once a risk assessment, based on the above considerations, has been conducted, it is important to characterise the situational context of the exposure to help understand the impact of a potential transmission event and whether situational factors may further mitigate or increase the level of exposure and associated risk.

Factors to consider when characterising the situational context:

- Type of work location, role, and environment (e.g., use of shared equipment, shared/communal spaces, high risk setting/persons, whether indoors or outdoors, level of vaccination coverage of workers in a health care setting)
- Other workplace mitigations in place during time of potential exposure (physical barriers, negative pressure rooms, ventilation characteristics in the relevant rooms/spaces and additional HEPA air filtration)
- Vulnerability of population (workers in health care setting and patients)
- Additional controls and residual risk of transmission in the setting (e.g. daily testing programs).

Based on these situational factors, the assessment team should consider whether the exposure risk should be amended and the worker's level of exposure risk reclassified. This will inform the final individual risk assessment, prior to moving to Step 2.

STEP 2: Assess the impacts of the work restrictions

Health services and their IPC staff, with support of PHUs, are responsible for operationalising and tailoring this guidance. This may involve consultation with other specialties where available, such as Work Health and Safety units and Infectious Diseases Specialists. While this framework cannot capture all the nuance and influential factors that may arise, the framework notes that there will be circumstances in which it is not possible to apply the recommended work permissions and restrictions as determined by the level of risk (outlined in Step 3).

In determining the final work restrictions and permissions for a staff member, the impact of these restrictions on the health services must be assessed. For example:

- If the majority or all staff in a highly specialised area are exposed
- If in a rural or regional setting where only a few staff members possess specialised skills
- If the health care service has a significant caseload without additional staff to engage.

In the first instance, health services should consider whether staff furlough can be compensated through rostering arrangements. Where possible, staff members requiring quarantine or furlough should be removed from the roster or replaced for their furlough/quarantine period.

Where this would significantly impact on the ongoing safe delivery of services, alternative rostering arrangements should be considered. This may involve:

- Redeployment of staff (e.g., accessing staff from other areas of a facility or bringing staff in from other facilities to fill roster gaps)
- Reducing hours of service operation if this can be managed whilst safely providing essential services
- Diverting patients to another facility, where this can be safely managed without overwhelming other essential health services
- Reducing the scope of service provision to only provide the highest priority care (e.g., delaying non-critical services)

Where these actions are not possible or would result in a significant disruption of essential services, it may be necessary to implement alternative mitigations so that staff members may continue working and providing essential services (see Step 3). In these circumstances, if the workforce impact is considered critical, health care services should work with the PHU to ensure their unique circumstances are considered and that appropriate mitigations are implemented (see Step 3).

STEP 3: Once exposure risk is determined, refer to the recommended work permissions and restrictions action matrix

After undertaking an individual risk assessment (Step 1) and considering impacts of work restrictions (Step 2), the assessment team should allocate a ‘risk assessment outcome’ to the worker (low, low to moderate, moderate or high). Based on the risk assessment outcome, the assessment team should consider the recommended work permission and restrictions, taking into account the impacts of these restrictions for the health care setting.

Where a worker is assessed as moderate or high risk, the PHU may recommend they undertake a period of quarantine. Where possible, workers who are advised to quarantine should complete the required quarantine period and should not attend work whilst in quarantine. However, noting that this may not be possible due to work requirements (as identified in Step 2), it may be necessary to implement mitigations so that workers may continue to work or have a reduced quarantine period.

In some circumstances, these arrangements may result in a worker who is in quarantine due to being a close contact being able to work (pending results of PCR testing) prior to being released from quarantine. This may be necessary due to substantial workforce impacts associated with the worker needing to quarantine. Workers should adhere to the guidance of the PHU. In some cases, this may involve attending work with appropriate mitigations, however being restricted from movements within the community.

The minimum recommended work permissions and restrictions for workers based on their risk assessment outcomes are outlined in Table 3. Final work permissions and restrictions should be determined in a case-by-case basis, in line with jurisdictional requirements. Additional mitigations may include:

- Daily or more regular screening requirements
- Daily testing requirements
- Additional PPE requirements
- Minimising risk of exposure to vulnerable people
- Adjusting staff rosters to minimise risk to patients and/or exposure of other staff (e.g., exposed workers tending to COVID-19 cases)

In determining the recommended work permissions and restrictions, the assessment team should also consider the work environment and individual circumstances of the worker. Adjustments to work permissions and restrictions may be required, and in some circumstances, this may involve adjusting the minimum requirements as outlined in Table 3. For example, in regional settings it may not be feasible to require daily saliva testing (recommended for high risk). In these circumstances, the assessment team may consider removing this requirement or implementing alternative arrangements.

Where the final recommended work permissions and restrictions deviate from the recommended minimum requirements (Table 4), this must be approved by the relevant delegate or Chief Health Officer. Decisions regarding the recommended work permissions and restrictions for the worker in a health care setting should be carefully documented. Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review the recommended restrictions to facilitate continuation of essential health services.

Table 1: Workers in health care settings exposure risk matrix – Fully vaccinated for COVID-19

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)		**EXPOSURE EVENT SCENARIO#**			
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.	
PPE WORN BY STAFF& CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Low to Moderate Risk	Moderate Risk	High Risk	
	Staff: Surgical mask only Case: No surgical mask	Low Risk	Low to Moderate Risk	High Risk	
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low Risk	Low to Moderate Risk	Moderate Risk Depending on risk assessment	High Risk Depending on risk assessment
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low Risk	Moderate Risk Depending on risk assessment	High risk Depending on risk assessment
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk	Low to Moderate Risk Depending on risk assessment	Moderate Risk Depending on risk assessment
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 2: Workers in health care settings exposure risk matrix – Unvaccinated or partially vaccinated for COVID-19

Note: Mandatory vaccination requirements for workers in health care settings will be set by jurisdictions.

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

	NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)	**EXPOSURE EVENT SCENARIO#**		
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.
PPE WORN BY STAFF & CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Moderate Risk	Moderate Risk	High Risk
	Staff: Surgical mask only Case: No surgical mask	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	Moderate Risk	High Risk
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low to Moderate Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Depending on risk assessment	High Risk
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Case: No mask	Low to Moderate Risk No prolonged/ cumulative/ physical contact / Moderate Risk Prolonged / cumulative/ physical contact
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 3: PPE breach risk assessment and actions

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

Determine level of exposure		Immediate actions	Actions once risk confirmed
LOW RISK BREACH	• Breaches in PPE that occur below the neck and are managed immediately (e.g., torn glove)	• Remove from situation • Remove PPE • Perform hand hygiene • Inform line manager	Follow actions for low risk as outlined in Table 4: Recommended work permissions and restrictions.
MODERATE RISK BREACH Increased risk of infection	• Incorrect use of PPE • Incorrect PPE for task • Contamination occurs during doffing (occurs above neck)	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Screening/testing • Continuous monitoring	Follow actions for moderate risk as outlined in Table 4: Recommended work permissions and restrictions.
HIGH RISK BREACH Likely risk of infection	• Exposure of mucous membranes by direct droplets from confirmed COVID positive (e.g., spitting in HCW face by confirmed COVID case) • Contamination occurs during doffing	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Closely monitor • Screen/test • Remove from immediate duties	Follow actions for high risk as outlined in Table 4: Recommended work permissions and restrictions.

Table 4: Recommended work permissions and restrictions as determined by risk

Note: This table represents minimum national recommendations, noting that adjustments may be made based the individual assessment (step 1) and consideration of impacts (step 2). Jurisdictions may implement additional requirements above these minimum national recommendations.

	RISK LEVEL			
	LOW RISK	**LOW TO MODERATE RISK**	**MODERATE RISK**	**HIGH RISK**
Work restrictions	Continue to work.	Continue to work.	Isolate until Day 2 RT-PCR test. If test result negative can return to work. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.	**Work restrictions** **Leave workplace immediately**. **Isolate** as a close contact **Potential to return to work early** if Day 5 test result is negative. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.
Testing	Be alert to mild symptoms, test if symptomatic	**Day 2 RT-PCR** test **Day 5 RT-PCR** test.	**Day 2 RT-PCR** test If test result negative may return to work. **Day 5 RT-PCR** test **Day 13 RT-PCR** clearance test.	**Day 2 RT-PCR** test. **Isolate**. **Day 5 RT-PCR** retest. **Isolate while result pending**. **Day 13 RT-PCR** clearance test.
	Any staff who develop symptoms must get a throat-nose swab and **isolate** until their result is known and symptoms have resolved.			
Return to work	N/A	N/A	**Work permissions. If Day 2 test is negative may return to work.** Workplace to consider need for additional surveillance testing; Daily or less frequent saliva testing.	**Work permissions. If Day 2 test and Day 5 test are negative**, may return to work at a single site, with additional surveillance testing; daily saliva tests and; **RT-PCR** retest **day 9 and 13.** Additional: - Be alert to mild symptoms - Test if symptomatic - Limit work to a single site/area.
Additional PPE Requirements on return to work?	**Wear a surgical mask at all times** in indoor spaces including staff only spaces, unless eating/ drinking.	**Wear a surgical mask at all times** in indoor spaces including staff only spaces, unless eating/ drinking. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT PCR test.**
Work across sites?	**In general, Yes**. Inform all employers of cross-site details.	**In general, Yes**. Inform all employers of cross-site details.	**No.** Consider limiting work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work in with vulnerable persons.	**No.** Limit work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work is with vulnerable persons.
	If there is an outbreak at a workplace—i.e. if there is previously demonstrated transmission—even low-risk exposures should limit work to a single site.			
	Workers in COVID Streaming Areas must follow any jurisdiction workplace directions from the Chief Health Officer.			

Appendix E: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew close contacts. For more information on contact tracing of aircraft passengers see Close Contacts- Aircraft passengers and crew.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a close contact:
    - Face-to-face contact with a confirmed case during their infectious period.
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period.
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHUs should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as close contacts.

Additional considerations for conducting a risk assessment should include:

1. **Variants of concern**
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

2. **Proximity of crew to confirmed cases**
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. **Duration of exposure to confirmed cases**
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

4. **Size of the compartment in which the crew and confirmed case interacted**
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered close contacts.

5. **The number of confirmed cases of COVID-19 on board**
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. **Potential breaches of PPE**
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

Aircrew and passengers who are close contacts

If an airline becomes aware of a crew member or passenger who was a close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix F: Guidance on the management of aircrew.

Appendix F: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Aircrew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix G: Full revision history of the COVID-19 SoNG

Revision history

Version	Date	Revised by	Changes
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-

Version	Date	Revised by	Changes
			risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.

Version	Date	Revised by	Changes
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings,

Version	Date	Revised by	Changes
			Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.

Version	Date	Revised by	Changes
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 6.2

09 December 2021

Summary of revision history

For full revision history, refer to Appendix G

Version	Date	Revised by	Changes
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for COVID-19. Jurisdictions may adapt this guidance based on local epidemiological context.

Updates to this guideline reflect community transmission in some jurisdictions and Australia's progress through the *National Plan to transition Australia's National COVID-19 Response*. See Appendix B for additional considerations for jurisdictions with low or no community transmission. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, refer to *Infection Control Expert Group-endorsed infection prevention and control guidance*.

Public health priority

Urgent – initiate public health responses as soon as possible. Public health responses may be automated and prioritised to assist with maintaining public health workforce capacity.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status.

Hospitalised confirmed cases should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of confirmed COVID-19 patients, including personal protective equipment (PPE), see ICEG-endorsed infection control guidance.

Historical cases do not need to isolate and public health units (PHUs) do not need to follow up their contacts.

Contact management

PHUs should manage close contacts according to management of contacts guidance.

Unvaccinated or partially vaccinated close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period. Vaccinated close contacts must quarantine for 7 days following last close contact with the confirmed case during their infectious period. Close contacts should monitor for development of fever or COVID-19 symptoms during this period, where feasible, and test for SARS-CoV-2 if symptoms develop.

2. Key definitions

Low or no community transmission

Low or no community transmission, in this guidance refers to infrequent or no COVID-19 cases acquired within a PHU's geographic area of responsibility.

Community transmission

Community transmission, in this guidance refers to when there are multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction.

Fully vaccinated person

Fully vaccinated refers to a person who is ≥14 days following receipt of the final dose of a primary course of COVID-19 vaccine approved or recognised by the Therapeutic Goods Administration (TGA)[1].

Partially vaccinated person

Partially vaccinated refers to a person who has received at least one dose of a COVID-19 vaccine registered by the TGA but does not meet the definition of a fully vaccinated person.

Reinfection

A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed COVID-19 that is determined to be a separate episode to the first based on epidemiological and/or laboratory findings. SARS-CoV-2 RNA detection must be greater than 90 days after the first laboratory confirmed infection to be considered reinfection. Wherever feasible, whole genome sequencing should be undertaken for suspected reinfections.

Breakthrough infection

A confirmed episode of SARS-CoV-2 infection in a fully vaccinated person > 14 days following their final dose of a primary course of COVID-19 vaccine.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

[1] There may be differing operational definitions of fully vaccinated in jurisdictions and for purposes of international travel.

3. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. In 2021, the SARS-CoV-2 Delta variant became the predominant variant of the virus in Australia.

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (1).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (2). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (2).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings, in the context of certain behaviours, such as singing and shouting (3) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (2). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (4, 5). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (6).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of early SARS-CoV-2 variants ranged from 2–4 (7). R_0 for confined settings were potentially at the higher end of this range. The Delta variant of SARS-Cov-2 is more transmissible than previously identified variants with infectiousness nearly twice that of the historical variant (8).

Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (9, 10).

SARS-CoV-2 variants of concern or interest

As the pandemic progresses SARS-CoV-2 variants continue to emerge. Some variants are classified as 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (11, 12).

As VOC are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, disease severity, vaccine efficacy, immunity after previous infection, incubation period, and infectious period. These factors have implications for public health measures necessary to protect the community and the health system. There may be a delay between the identification of cases in Australia who are infected with a new VOC, and the availability of data and evidence to guide appropriate public health interventions. Where there are emerging VOC with uncertain viral characteristics, it is prudent for jurisdictions to consider a more conservative approach to case and contact management, such as increased testing, isolation and quarantine requirements until more is known about the VOC and its epidemiological and clinical implications. More conservative public health and social measures may also be considered during this time. Depending on the characteristics of the virus, these measures may remain in place, even once the epidemiological and clinical implications are known.

Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

The Communicable Diseases Genomics Network (CDGN) actively monitors variants and their reported mutations to understand how they influence the behaviour of the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see Infection Control Expert Group (ICEG) endorsed infection control guidance.

Incubation period

Prior to the emergence of the Delta variant, the median incubation period for people who became symptomatic was 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (13-15). Around 1% of COVID-19 cases developed symptoms more than 14 days after exposure (16). Evidence for the Delta variant incubation period is still emerging, however some studies suggest it may be shorter than other lineages (17, 18).

There is currently limited evidence to determine how the incubation period for breakthrough infection in vaccinated individuals may differ from infection in unvaccinated individuals.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (19, 20). Pre-symptomatic transmission can occur 1-3 days before symptom onset (21, 22). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (23).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (20). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (23). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (24).

It has been demonstrated that the Delta variant is associated with higher viral burden and longer duration of viral shedding compared to previous variants of SARS-CoV-2 (25, 26). Currently available evidence suggests that initial viral load is similar between vaccinated and unvaccinated individuals, however some studies have found that vaccinated people have a more rapid decline in viral load than unvaccinated people (27-29).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the PHU. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (30-32). Other symptoms include headache, sore throat, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (30-33). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (34).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. International cohort studies have suggested unvaccinated or partially vaccinated people infected with the Delta variant are more likely to be hospitalised than patients infected with the Alpha variant (35, 36)

Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (19, 20, 37-40). It is unclear at this stage whether the higher viral burden associated with the Delta variant has changed the proportion of asymptomatic infections.

Fully vaccinated people can still become infected though infection is less likely than in someone who is unvaccinated. Disease associated with breakthrough infection is less severe, however, the risk of onward transmission appears to be similar to that for

unvaccinated individuals (41); however the period of infectiousness appears to be shorter in vaccinated cases. Severe disease can still occur in a small proportion of vaccinated people particularly the elderly and those with certain co-morbidities (42, 43).

COVID-19 in children

Acute infection with SARS-CoV-2 is generally associated with mild disease in children, and compared to adults, children have almost 25 times lower risk of severe disease (44, 45). However, however the period of infectiousness appears to be shorter in vaccinated cases. children may be hospitalised for social, rather than clinical, reasons, for example if both parents are too unwell to care for them. A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (46).

Longer term outcomes of COVID-19

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (47). A large systematic review of the body of evidence collected on the post-acute sequelae of COVID found the median proportion of COVID-19 survivors experiencing at least one sequelae was 54% at 1 month (short-term), 55% at 2 to 5 months (intermediate-term), and 54% at 6 or more months (long-term.) (48, 49). In the UK, prevalence of self-reported post-acute sequelae of COVID-19 has been highest in people aged 35 to 69 years, females, people living in more disadvantaged areas, people working in health or social care, and people with disabilities (50).

Case fatality rate

For confirmed cases reported globally, the crude case fatality rate (CFR) is approximately 2.0% (51). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems and patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is less than 1% (based on surveillance data notified in Australia as of 07 December 2021). As of 07 December 2021, 43% (884/2065) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (52).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (52). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (52, 53).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (53). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response,

in patients who recovered from severe, compared to mild, disease (53). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Durability of immunity after SARS-CoV-2 infection likely differs significantly from person to person depending upon a range of factors (age, co-morbidities and pre-existing immunosuppression and previous vaccination). Studies suggest a strong immune response after previous infection, with effective natural immunity to future infectious in most individuals (54). However, vaccination continues to provide the best protection against reinfection (55-59).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- Come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including:

- multiple exposure points;
- staff who may have a perceived need to continue work despite being unwell; and
- language barriers for people from culturally and linguistically diverse backgrounds.

Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;
- residential care facilities;

- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

4. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and, as much as possible, disease transmission. It is anticipated that high levels of COVID-19 vaccination coverage will facilitate the progressive winding back of public health and social measures such as travel restrictions and physical distancing.

As of October 2021, the Australian Technical Advisory Group on Immunisation (ATAGI) recommends vaccination for all individuals aged 12 years and over in a two-dose vaccine schedule (3 doses for severely immunocompromised individuals). ATAGI supports the use of a single booster dose for people who completed their primary COVID-19 vaccine course ≥6 months ago. This will initially include, but not be limited to, groups who were prioritised in the rollout of the vaccine program from early 2021. For more information, see ATAGI recommendations on the use of a booster dose of COVID-19 vaccine.

The COVID-19 vaccines registered for use in Australia have all been shown to be highly effective against severe disease, including due to the Delta variant (60). Vaccine effectiveness against hospitalisation due to Delta infection has been shown to be 95.2% and 98.4% for Vaxzevaria (AstraZeneca) and Comirnaty (Pfizer), respectively, 2 to 9 weeks following the second dose (60). The effectiveness of these two vaccines against death has been shown to be 94.1% and 98.2%, respectively (60). Existing vaccine safety monitoring systems have been strengthened, with weekly COVID-19 vaccine safety reports provided by the Therapeutic Goods Administration and AusVaxSafety active surveillance system.

Other prevention activities

When combined, prevention and control activities, can help limit the spread of certain respiratory diseases, including COVID-19. These measures may include:

1. Physical distancing and gathering
    - Physical distancing can reduce the potential for transmission. Physical distancing measures may include:
        - maintaining a distance of 1.5m from people
        - density restrictions; and
        - limits on the number of people allowed to participate in an event.
2. Environmental controls, such as optimised ventilation

3. Personal hygiene
    - PHUs should encourage good hygiene practices to prevent SARS-CoV-2 infection including:
        - wearing a face mask where physical distancing cannot be maintained, particularly indoors;
        - staying home if unwell;
        - effective hand and respiratory hygiene; and
        - cleaning surfaces
4. Travel restrictions
    - Some jurisdictions will require quarantine or testing of domestic and international travellers. See *COVID-19 FAQs- international travellers to Australia.*

5. Surveillance

There are five main objectives of surveillance for COVID-19, which are to rapidly:

1. Identify, isolate and manage cases.
2. Identify, quarantine and provide relevant information to contacts.
3. Detect and manage clusters and outbreaks.
4. Characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place;
    - describing the transmission dynamics;
    - identifying groups at special risk of infection or more severe disease; and
    - monitoring for SARS-CoV-2 variants.
5. Monitor the effectiveness of the following routine prevention and control activities, in managing the COVID-19 outbreak over time:
    - vaccination;
    - test, trace, isolate and quarantine processes; and
    - public health and social measures.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, vaccination status, place of residence, occupation, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be collected, with additional information being followed up based on risk assessment.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

PHUs should enter initial information on confirmed and historical cases of COVID-19 onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enter enhanced surveillance data shortly after case follow-up. Jurisdictions are encouraged to prioritise and automate as many of these processes as possible, including linking COVID-19 cases to clinical services.

6. Cases

Definitions

Reporting

Notify both confirmed cases and historical cases in the jurisdiction of public health management.

People meeting the confirmed or historical case criteria who were previously diagnosed and managed overseas or in another Australian jurisdiction do not need to be re-notified. In this situation, the person should provide documented evidence of diagnosis overseas or interstate to the PHU.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing;

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[1].

Historical case

The historical case definition intends to capture cases who were infected sometime in the past that were not previously reported and are not considered infectious at the time of diagnosis. Further laboratory testing is required to meet this criterion.

A historical case requires:

i. Laboratory evidence to support a historic infection; **AND**

ii. Absence of clinical evidence in the 14 days prior to swab date of positive test

Laboratory evidence for historic infection:

1. For people who have not been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[2]; **AND**
    - A subsequent PCR is negative OR suggestive of a historical infection[2], taken at least 24 hours apart; **AND**
    - Detection of IgG or total antibody[1];

OR

2. For people who have been vaccinated:
    - Detection of SARS-CoV-2 by PCR with initial test results suggestive of a historical infection[2]; **AND**
    - A subsequent PCR is negative, taken at least 24 hours apart.

Clinical evidence

- Fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[3]; or
- Loss of smell or loss of taste.

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[2] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

[3] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Specimen collection and testing for SARS-CoV-2

Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) or transcription-mediated amplification (TMA) is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection. For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; and different types of SARS-CoV-2 specific testing, see *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Alternative testing methods, including rapid antigen testing for SARS-CoV-2, may be used in specific contexts and settings where pre-test probability is high. See *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests*. PHUs should follow jurisdictional guidance on the use of rapid antigen tests.

See *CDNA and PHLN Testing Framework for COVID-19 in Australia* for guidance on local approaches to testing, including key priority groups based on the likelihood of infection and the epidemiological situation.

Guidance on Personal Protective Equipment (PPE) for specimen collection is available from *ICEG-endorsed infection control guidance*.

Who to test for SARS-CoV-2

It is important to maintain high rates of testing to rapidly detect all infections and identify chains of transmission in the community.

Test the following people:

1. **Symptomatic People**

People who have at least one of the following COVID-19 like symptoms should test for SARS-CoV-2.

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat); or
- Loss of smell or loss of taste.

Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. SARS-CoV-2 testing should be considered when assessing patients presenting with non-specific signs of infection.

2. **Asymptomatic people**

People who have higher risk of exposure to SARS-COV-2 should test for SARS-CoV-2, including:

- International arrivals
- Close contacts of COVID-19 cases
- People who provide care for COVID-19 cases (e.g. Health care workers).
- Domestic and international aircrew
- Workers in managed quarantine facilities

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHUs should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Stay at home requirements after COVID-19 testing

Health care workers providing testing services should clearly communicate the following stay at home requirements after COVID-19 testing:

1. Symptomatic people who have tested for SARS-CoV-2 should stay at home until they receive a negative test, regardless of vaccination status.
2. Asymptomatic people who are not close contacts do not need to stay at home whilst awaiting a negative test result, unless instructed to stay at home by a public health authority.

See Management of Contacts for guidance on quarantine and testing of close contacts.

See Appendix B for additional post-testing instructions for jurisdictions with low or no community transmission.

Assessing indeterminate and suspected false positive PCR results

Australian laboratories use highly accurate SARS-CoV-2 PCR assays and, where required, have procedures in place to confirm test results. Where there is active COVID-19 in the community, the positive predictive value of PCR testing is very high (with the exception of persistent shedding). However, indeterminate or suspected false positive SARS-CoV-2 test results may still occur. PHUs may assess indeterminate or suspected false positive PCR results in order to avoid unnecessary isolation of cases, quarantine of contacts, and strain on public health resources.

Indeterminate or inconclusive PCR results

Indeterminate results may occur due to low viral loads; persistent shedding; or non-SARS-CoV-2 reactivity in the PCR test. In these circumstances, PHUs should contact the laboratory microbiologist to discuss the results and decide whether further testing is required. Consider results in the context of the clinical and epidemiological circumstances to inform whether further public health action is required.

PHUs can use the below actions for suspected false positive PCR results to determine whether to manage the person with indeterminate PCR results as a COVID-19 case.

Suspected false positive PCR results

PHUs might suspect a false positive SARS-CoV-2 PCR result when there are no epidemiological risk factors for COVID-19. This is particularly relevant for jurisdictions with low or no community transmission with high levels of enhanced testing.

If a false positive PCR result is suspected, PHUs should contact the laboratory microbiologist to obtain more details of the PCR test results before designating the result a false positive. The laboratory microbiologist will investigate whether there is evidence of laboratory error or non-specific reactivity in the PCR test, and ascertain whether further testing of the sample is required. If further laboratory investigations provide convincing evidence the case is negative, the test may be considered a false positive and the laboratory will issue an amended report.

For more information on the possible sources of false positive PCR test results, see *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

Further PHU actions for suspected false positive PCR results

PHUs should conduct further assessments (in close collaboration with the laboratory microbiologist and treating clinician) for suspected false positive results.

Consider a case conference with experienced public health practitioners, the microbiologist and the treating clinician. In some jurisdictions, there may already be established panels for this purpose. Where there is uncertainty or difficulty reaching agreement on whether the PCR is a false positive, assess the risks associated with missing a true COVID-19 case.

PHUs should:

1. Continue all relevant public health action, including case isolation and contact tracing, until the test is determined to be a false positive.
2. Thoroughly review the case's clinical history (including for mild/atypical symptoms, delayed onset of symptoms, history of compatible illness) and potential epidemiological links. Consider the likelihood of true asymptomatic infection, pre-symptomatic infection, mildly symptomatic infection, and previous infection with persistent viral shedding.
3. Immediately collect another respiratory specimen for PCR testing, where feasible.
4. Consider testing close contacts, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
5. Record the results of the investigation, including relevant laboratory information following discussion with the microbiologist, into a standard report.

PHUs can cease all public health interventions once a PCR result is confidently considered false positive. If the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed cases:

Begin follow up investigation of confirmed cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Complete case interviews, exposure site identification and close contact identification within 1 day of notification of a confirmed case. Jurisdictions may choose to prioritise cases for follow up and automate many of these case management processes.

PHUs should ensure that staff are available to contribute to the expert assessment of patients under investigation on hospital clinician or general practitioner request.

Historical cases:

Confirmed historical cases do not need to isolate and PHUs do not need to follow up their contacts.

Response procedure

Genomic sequencing

Genomic sequencing is an important part of SARS-COV-2 surveillance and can be used to monitor transmission dynamics, identify lineages of concern, and inform outbreak investigation and public health response.

Jurisdictions have varying capacities to conduct whole genome sequencing. In jurisdictions where community transmission is established, it may not be justifiable to attempt to sequence every COVID-19 case. In these situations, PHUs should employ prioritisation strategies based on their jurisdiction's epidemiological context, capacity and priorities. This approach balances the costs and benefits of real-time SARS-CoV-2 genomic surveillance, where there is rapid spread of a dominant variant.

The *CDGN, PHLN and CDNA Sampling strategy for SARS-CoV-2 genomic surveillance* provides guiding principles and outlines an approach to selective and targeted sequencing. This includes guidance on priority groups for targeted sampling (e.g. international travellers).

For further information, see:

- *PHLN guidance on laboratory testing for SARS-CoV-2*
- *Testing Framework for COVID-19 in Australia*
- *Australian National Disease Surveillance Plan for COVID-19*

Case investigation

Ideally, PHUs should respond to COVID-19 case notifications as soon as possible via a case interview. However, where public health capacity is exceeded, PHUs may choose to automate and prioritise case investigation processes (e.g. SMS based questionnaires). PHUs can use Appendix A- COVID-19 PHU checklist and their state or territory COVID-19 case report as a guide for case investigation.

PHUs should ensure the following actions have taken place for each case:

- Isolate the case and confirm their last day in community
- Confirm any symptoms of the illness and the symptom onset date
- Confirm relevant pathology test results and any additional tests required, including repeat tests where relevant.
- Record vaccination status including vaccine type, dosage, date and country of administration.
- Review both case and contact management.
- Commence or complete contact tracing, aiming to place close contacts in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Where possible, identify the likely source of infection.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. For further advice on clinical management, see:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Prophylaxis against severe disease:

Proactive use of monoclonal antibody therapy in people at high risk of developing severe disease may help prevent hospitalisation if it is administered within the first five days of developing symptoms. PHUs, in conjunction with the local clinical team, can help identify cases for clinical treatment early. For further information on emerging clinical treatments, see *National COVID-19 Clinical Evidence Taskforce*.

Education

PHUs should educate cases about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Hospitalised COVID-19 patients

To minimise the risk of transmission from hospitalised COVID-19 patients, PHUs should encourage hospitals to undertake a system based risk assessment. Hospitals can manage risk by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Hospitalised confirmed cases should be isolate in a negative pressure room with anteroom, where available. If a negative pressure room is not available, the hospitalised case can isolate in a standard isolation room or single room with negative airflow as an alternative. Avoid rooms with positive pressure airflow.

If there is concern about a potential exposure related to a hospitalised case, PHUs should undertake a risk assessment on hospital staff, visitors or other patients to determine whether further public health response is required (See Appendix D).

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital (see above), at home, or other community residential settings identified by the PHU. Cases can isolate at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- it can be assured that the home environment permits separation of the case from other household members;
- the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- there is a reasonable level of confidence of the compliance of the case.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test PCR positive during their quarantine period, but their infection may have occurred previously and be 'historic' rather than acute. Similarly, occasionally a person may have a PCR result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the PCR assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another pathogen.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, testing for other respiratory pathogens should be performed.

PHUs should use the following criteria to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. PCR results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial PCR result suggestive of a historical infection[1] and a negative second PCR[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first PCR result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHUs and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] PCR results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. PCR results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms that do not report Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Release from isolation criteria for all confirmed cases who do not meet historical infection criteria

The following information details release from isolation criteria for confirmed cases. This includes confirmed cases infected with a SARS-CoV-2 variant of concern.

Laboratory based evidence suggests that people infected with the Delta variant have higher viral loads which remain high for a longer period of time than people infected with other known variants. There is a very small risk that a person infected with the Delta variant may still be infectious despite meeting release from isolation criteria listed below (Unpublished data). However, this very low risk does not justify extension of the release from isolation period beyond 14 days, nor justify a requirement for PCR testing prior to release for all cases (see Release from isolation and high-risk settings)

Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2 or 3 – whichever is applicable. Significantly immunocompromised cases will also need to meet additional criterion in point 4 in order to be released from isolation.

If a COVID-19 case is infected with an emerging variant of concern with unknown viral characteristics (e.g. Omicron), it is prudent for PHUs to consider a more conservative approach to release from isolation criteria (e.g. require all cases to fulfil criteria outlined for unvaccinated cases).

1. Confirmed cases who have remained asymptomatic

Fully vaccinated case	Unvaccinated/ partially vaccinated case or unknown vaccination status
The case can be released from isolation if: • at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed during this period. Some jurisdictions may support earlier release if: • at least 7 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed; and • PCR is negative at day 7 from specimen collection date.	The case can be released from isolation if: • at least 14 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed during this period. Some jurisdictions may support earlier release if: • at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by PCR was taken; and • no symptoms have developed; and • PCR is negative at day 10 from specimen collection date.

2. *Confirmed cases with resolution of fever and substantial improvement of respiratory symptoms*

Fully vaccinated case	Unvaccinated/ partially vaccinated case or unknown vaccination status
The case can be released from isolation if: • at least 10 days have passed since symptom onset; and • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]. Some jurisdictions may support earlier release if: • at least 7 days have passed since symptom onset; and • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]; and • PCR is negative at day 7 from symptom onset.	The case can be released from isolation if: • at least 14 days have passed since symptom onset; and • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]. Some jurisdictions may support earlier release if: • at least 10 days have passed since symptom onset; and • there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]; and • PCR is negative at day 10 from symptom onset.

3. *Confirmed cases without complete resolution of acute respiratory symptoms*

Fully vaccinated case	Unvaccinated/ partially vaccinated case or unknown vaccination status
The case can be released from isolation if they meet **all** of the following criteria: • at least 14 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • the case is not significantly immunocompromised[3] OR	The case can be released from isolation if they meet **all** of the following criteria: • at least 20 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness[1]; and • the case is not significantly immunocompromised[3] OR

The case can also be released from isolation if they meet **all** the following criteria: • at least 10 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 7 from symptom onset.	The case can also be released from isolation if they meet **all** the following criteria: • at least 14 days have passed since the onset of symptoms; • there has been resolution of fever for the previous 72 hours; • there has been substantial improvement in respiratory symptoms of the acute illness [1]; and • two consecutive respiratory specimens negative[2] for SARS-CoV-2 by PCR taken at least 24 hours apart after day 10 from symptom onset.

4. Significantly immunocompromised persons

In addition to meeting the appropriate criteria described in points 1 or 2 above, confirmed cases who are significantly immunocompromised[3] must meet a higher standard requiring additional assessment.

Regardless of vaccination status, COVID-19 cases who are immunocompromised can be released from isolation when they meet the following additional criterion:

- PCR negative[2] on at least two consecutive respiratory specimens collected at least 24 hours apart after day 7 from symptom onset[4].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). PHUs should discuss this with the treating medical practitioner and the testing laboratory.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count

below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be PCR negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be PCR negative.

Testing after release from isolation

Routine PCR testing post-release from isolation is not recommended unless the person re-develops clinical features consistent with COVID-19.

If a case has not re-developed COVID-19 symptoms but is swabbed and tests positive after they have met the above release from isolation criteria, then the case does not require re-isolation. Current evidence and Australian public health experience indicates these people are unlikely to be infectious.

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness consistent with a historic infection, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Release from isolation and high-risk settings

Cases returning to a high-risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

However, there is some laboratory based evidence that a small proportion of people with a Delta variant infection may still be infectious despite fulfilling the appropriate criteria above. Some jurisdictions with low or no community transmission may require additional criteria or measures for cases who will be released back to high-risk settings.

Note: Hospitalised patients who are being transferred to another ward or hospital should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non COVID-19 related condition.

Release from isolation and re-exposure

A person without significant immunocompromise who has recovered from COVID-19 does not need to quarantine if they become a close contact of a confirmed case and the re-exposure was less than 6 months since the recovered case's symptom onset (or first positive PCR test if the case was asymptomatic).

Recovered cases, unless immunocompromised, can continue to attend high-risk settings and do not need to be furloughed from work if re-exposed during this 6 month period.

For recovered cases re-exposed after 6 months from their symptom onset (or first positive test if asymptomatic), and immunocompromised recovered cases exposed at any time after release from isolation, consider serology testing in consultation with the microbiologist and/or virologist at the testing laboratory when making decisions about quarantine and exclusion from the high-risk settings.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Re-exposed recovered cases should self-monitor for symptoms clinically consistent with COVID-19 for 14 days after the last contact with the confirmed case. If symptoms reappear, they should immediately self-isolate and be re-tested for SARS-CoV-2. As further evidence becomes available on the duration of immunity, these recommendations may be amended.

Release from isolation and gastrointestinal symptoms

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. Cases who have persistently positive faecal samples test results after meeting release from isolation criteria, may need to follow further precautions or exclusions on a case-by-case basis:

- All cases with diarrhoea should not prepare/ food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. health care workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are PCR negative in faecal samples. People who remain persistently PCR positive in faecal samples use soap and water or alcohol-based sanitiser for hand hygiene. PHUs should provide education emphasising the importance of proper hand hygiene to all cases upon release from isolation.

7. Contacts

Close contact definition

The aim of contact tracing is to interrupt transmission of SARS-CoV-2 through identification and quarantining of people in contact with infectious cases. PHUs can use the below close contact criteria to identify and prioritise people who may have been exposed and potentially incubating the disease.

In jurisdictions with community transmission, where public health workforce capacity is exceeded, PHUs should focus contact tracing efforts on higher risk close contacts in households or settings at highest risk of extensive transmission.

If a COVID-19 case is infected with an emerging variant of concern with unknown viral characteristics (e.g. Omicron), it is prudent for PHUs to consider a more conservative approach to close contact identification (see Appendix B for an example alternative definition). In this situation, PHUs may consider upgrading contact classifications and management to a higher risk category.

Contact classification	Type of contact made during the case's infectious period
Close contact	A person who has had at least 15 minutes face to face contact with a COVID-19 case and there is reasonable risk of transmission including: • Household contacts • Social contacts with extensive interaction with the case • Contacts in settings at highest risk for extensive transmission or severe outcomes of infection (e.g. Abattoirs, hospitals, accommodation facilities for vulnerable people)
Lower risk contact	A person who has had less than 15 minutes face to face contact with a COVID-19 case and there is some risk of transmission based on: • vaccination status of both case and contact; • PPE use of both case and contact (e.g. mask type, see Appendix D for health care settings) • the setting (e.g. indoors vs outdoors, size of room, adequacy of ventilation); • the specific variant of SARS-CoV-2; and • the nature of the exposure (e.g. whether shouting or singing).

It is difficult to prescribe a minimum duration of contact that results in infection, as even fleeting personal interactions can result in infection with SARS-CoV-2. The definitions of close contacts listed above represent prioritisation based on risk of infection in a setting where some COVID-19 transmission is acceptable in the community.

Some jurisdictions have developed risk matrices for classification of close contacts in certain settings (e.g. for schools, workplaces). The rationale for risk assessment guidance is to balance COVID-19 transmission risk with the risk of furloughing staff to the extent that the

business becomes non-operational. Such guidance will take account of specific risk mitigations within the operation of the business.

For additional considerations for identification of contacts in jurisdictions with low or no community transmission see Appendix B.

Note that:

- For contact tracing, the infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).
- If the case is asymptomatic, the infectious period is the period extending from 48 hours before the initial positive test until the case is classified as no longer infections (refer to Release from isolation).
- For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, see Appendix D.

Management of contacts

PHUs should assess all persons identified as having had contact with a confirmed case to determine if they should be managed as a close contact. Where possible, PHUs should collect demographic and epidemiological data. Jurisdictions are encouraged to automate contact management processes where feasible.

If a COVID-19 case is infected with an emerging variant of concern with unknown viral characteristics (e.g. Omicron), PHUs may manage contacts more conservatively, e.g. require all close contacts to follow quarantine or testing requirements outlined for unvaccinated close contacts. PHUs may also consider additional quarantine and testing requirements for lower risk contacts (Appendix B).

Quarantine and restriction of close contacts

Where feasible, PHUs should ensure careful selection of a contact's site of quarantine to prevent transmission to others. Some residences may not be feasible if the person cannot quarantine away from other house members (e.g. small apartments, dwellings with multiple generations of family members).

The precautionary advice in this guideline uses an incubation period upper range of 14 days to guide public health measures such as quarantine. However jurisdictions may wish to consider alternate options for quarantine, including a possible mixed model approach (shorter quarantine followed by a time period of less stringent restrictions) based on local risk assessment.

Close contacts who have recovered from COVID-19 do not need to quarantine if:

- they remain asymptomatic;
- they are not immunocompromised; and
- re-exposure is less than 6 months since symptom onset (see Release from isolation and re-exposure).

In jurisdictions with community transmission, where public health workforce capacity is exceeded, PHUs should focus close contact management efforts on higher risk close contacts. Some jurisdictions may choose to have less active management of lower risk close contacts.

PHUs should advise close contacts to:

1. Monitor their health.
    - PHUs should provide advice on the processes for seeking medical care, including how to safely seek COVID-19 testing if symptoms develop. Refer to Medical care for quarantined individuals.
    - Resourcing permitting, PHUs may conduct active monitoring of close contacts for COVID-19 symptoms for 14 days after last possible contact with a confirmed COVID-19 case. This may include via daily SMS follow up.
2. Quarantine for a specified period following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for the specified minimum period regardless of any negative test result (see below).
3. Get tested during the quarantine period (see below table).

Quarantine and testing requirements for close contacts

Fully vaccinated close contacts	Unvaccinated/partially vaccinated close contacts or unknown vaccination status
Quarantine requirements • At a minimum, fully vaccinated close contacts should quarantine for 7 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. • Quarantine must occur for 7 days regardless of any negative test result. **Testing during quarantine** • Testing of close contacts should occur: ○ If COVID-19 symptoms develop ○ On entry to quarantine ○ Before exit from quarantine - A test late in the quarantine period (e.g. after day 5-post exposure), should be conducted. - In some circumstances, PHUs may also consider the need for extension of quarantine if a close contact refuses to undergo exit testing. • If laboratory testing systems are under strain, PHUs may consider not testing close contacts (particularly household	**Quarantine requirements** • At a minimum, unvaccinated or partially vaccinated close contacts should quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. • Quarantine must occur for 14 days regardless of any negative test result. **Testing during quarantine** • Testing of close contacts should occur: ○ If COVID-19 symptoms develop ○ On entry to quarantine ○ Before exit from quarantine - A test late in the quarantine period (e.g. day 12-13), should be conducted. - In some circumstances, PHUs may also consider the need for extension of quarantine if a close contact refuses to undergo exit testing. ○ Mid-quarantine (where appropriate) - If there is reason to doubt compliance with quarantine or high

contacts) who develop symptoms, and instead considering them probable cases if they develop symptoms. **Other measures** • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house. • Jurisdictions with low or no community transmission may implement more conservative approaches.	risk of the close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies are useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- PCR testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix C: Outbreak investigation and management).

Health and residential care workers

For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, see Appendix D.

Aircraft passengers and crew

Passengers

At a minimum, PHUs should classify aircraft passengers seated in the same row or two rows in front or behind a confirmed COVID-19 case during the case's infectious period as close contacts. In the context of any emerging variant of concern with unknown viral characteristics, PHUs may classify all passengers on board the flight as close contacts. PHUs can use similar criteria for people who have had close contact on bus or train trips.

Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport.

Risk assessment and management of aircrew

For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify aircrew close contacts. Refer to Appendix E and Appendix F for further information.

Quarantine and essential workers

Close contacts who are essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, PHUs should conduct an individual risk assessment to identify if some essential workers can be permitted to maintain normal work patterns while in quarantine.

This should only occur in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If permitted to maintain normal work patterns, the essential worker must practise vigilant physical distancing and hand and respiratory hygiene, and wear a mask whilst at work. They should adhere to normal quarantine restrictions when outside of essential work activities.

Medical care for quarantined individuals

PHUs should advise close contacts that if they require medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department and advise them of their close contact status before presenting. Close contacts with severe symptoms should call 000 and clearly communicate to the emergency services operator that they are a close contact. Close contacts should wear a mask before presenting to any health care setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with COVID-19 develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by the PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by PCR should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

8. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

9. Special situations

Use of COVID-19 vaccination in outbreak situations

Targeted vaccination of defined populations who may be at risk of exposure is an important activity complementing existing public health interventions. Targeted vaccination may increase the proportion of people who have received one dose, are fully vaccinated, or have received a booster dose of a COVID-19 vaccination (where eligible).

In an outbreak, PHUs can use COVID-19 vaccination to:

1. Reduce the number and severity of COVID-19 cases in an outbreak, where there is likely to be an ongoing risk of exposure.
2. Opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

Key considerations about using COVID-19 vaccines during outbreaks include: the location, target population, context of the outbreak, local epidemiology of COVID-19, and timing of potential exposure.

Vaccination as an outbreak response tool is of greatest use in geographic areas or populations with low vaccination coverage. However, public communications should emphasise the importance of people getting vaccinated even in areas of high coverage.

PHUs can also use COVID-19 vaccination in closed settings where there is an ongoing risk of exposure due to multiple chains of transmission. Example settings include residential aged care facilities, correctional facilities, remote industrial sites (e.g. mining camps) or educational institutions.

In these contexts, vaccination may provide both direct protection against severe illness and death, and indirect protection by limiting outbreak size and duration.

Where possible, PHUs should evaluate the effectiveness of vaccination campaigns in limiting the impacts of COVID-19 at the conclusion of the outbreak.

International travellers

Quarantine requirements for international travellers entering Australia are different for fully vaccinated versus partially or unvaccinated arrivals. It is important to note that the definition of fully vaccinated for international travel purposes differs to the definition included in this guidance. For more information about vaccination and international travel, pre-flight testing and travel requirements, see *International travel and COVID-19* and *Coronavirus (COVID-19) FAQs – international travellers to Australia*.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

If a confirmed case has attended the workplace while infectious, PHUs can assist workplaces to conduct a risk assessment of potential workplace transmission. This includes assisting workplaces in the identification of workers who have had close contact with the infected worker. PHUs should provide workplaces with a general framework to help with internal risk assessment. In settings with high vaccine coverages, PHUs may take a more considered approach to risk assessment to ensure that economic and social costs are minimised. For more information, see *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

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11. Appendices

Appendix A: Public health unit checklist

Appendix B: Additional considerations for jurisdictions with low or no community transmission

Appendix C: Outbreak investigation and management

Appendix D: Work Permissions and Restrictions Framework for Workers in Health Care Settings

Appendix E: Risk assessment and identification of close contacts in aircrew

Appendix F: Guidance on the management of aircrew

Appendix G: Full revision history of the COVID-19 SoNG

Appendix A: Public health unit checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case; and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange PCR and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to High-risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection and follow the cross-border protocol for notifying cases to other jurisdictions as appropriate.

Consider need for media release and designate a media spokesperson.

Appendix B: Additional considerations for jurisdictions with low or no community transmission

This appendix provides additional testing and contact management considerations for PHUs in jurisdictions with low or no community transmission. PHUs in jurisdictions with low or no community transmission may decide to trace and manage casual and secondary close contacts.

As jurisdictions move towards a context of community transmission, and public health capacity is exceeded, PHUs may discontinue using this additional guidance.

Additional testing considerations

In jurisdictions with low or no community transmission, individuals meeting the suspect case definition may be tested for SARS-CoV-2.

Jurisdictions with low or no community transmission may also conduct additional testing for screening purposes, for example in COVID-19 quarantine and isolation facilities and workers in health care settings.

Applying a suspect case definition

In jurisdictions with low or no community transmission, PHUs can use the suspect case definition to identify those who may have an increased likelihood of current SARS-CoV-2 and where having such a definition may continue to have public health utility.

Suspect cases may require specific infection prevention and control measures and public health management. Suspect cases do not need to be notified to the NNDSS.

A suspect case is a person who meets the below **clinical** and **epidemiological** criteria.

Clinical evidence (in the past 14 days):

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[1]; or
- Loss of smell or loss of taste.

Epidemiological evidence (in the past 14 days):

- Close contact with a confirmed case
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services
- International air, maritime and border staff
- Health care workers with potential COVID-19 patient contact
- People who have been in areas with COVID-19 community transmission

Notes:

[1] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Management of suspect cases

PHUs may consider undertaking case interviews, exposure site identification and close contact identification for suspect cases. PHUs may undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and there remains high suspicion that the person has COVID-19, PHUs may support continued isolation and use of relevant infection prevention and control precautions, whilst awaiting further testing and re-assessment (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*.

Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. See Post-testing instructions and isolation requirements for suspect cases and enhanced testing.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions with low or no community transmission may conduct routine testing of international travellers who are in hotel quarantine. Testing may occur on day 0–2 and then on day 12-14, preferably as late as possible, of hotel quarantine. Some jurisdictions may undertake mid-quarantine testing for earlier identification of cases and require confirmation of exit testing prior to release from quarantine. Some jurisdictions may also require further testing after the traveller has left managed quarantine.

Exact arrangements for post-quarantine testing depend on state and territory protocols.

COVID-19 quarantine and isolation facility workers

Some jurisdictions may require COVID-19 quarantine and isolation facility workers to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may implement additional requirements for quarantine workers. See Australian Health Protection Principal Committee (AHPPC) statement on National Principles for Managed Quarantine.

Testing in health care settings

Jurisdictions with low or no community transmission may request routine testing of staff in health care settings, in addition to other control strategies. Periodic and comprehensive screening of staff in health care settings can assist in earlier identification of infection in health care environments.

Routine testing of staff in health care settings is recommended on a voluntary basis. However, jurisdictions may determine the triggers for when routine testing is implemented and implement mandatory testing in certain high-risk situations. Jurisdictions may determine

the appropriate frequency and method for routine testing, depending on the specific circumstances.

Considered routine testing for health care setting staff who:

- directly care for COVID-19 patients
- work at COVID-19 testing sites
- provide occasional or intermittent care to COVID-19 patients (e.g. medical consulting units, pharmacists, allied health)
- work within the patient/client/resident zone for COVID-19 patients (e.g. ward clerks, cleaners, pharmacy deliveries, food delivery)
- transport a COVID-19 patient to a health care setting work in high risk areas of the hospital that don't have confirmed cases (e.g. staff in emergency departments)
- work in community health centres (e.g. GP led respiratory or fever clinics)

Provided they do not have COVID-19 symptoms and are not a close contact, staff in health care settings who undergo routine testing are not required to isolate whilst awaiting a negative result and may continue to work.

If staff are away from work for 7 days or more, they may be requested to undertake a COVID-19 test with oropharyngeal and deep nasal or nasopharyngeal swabs. E.g. Every 7 days while away until 14 days have passed since they were last at work.

Jurisdictions may also need to consider testing requirements for staff:

- working across wards or campuses
- working between hospitals/jobs
- who are inpatients or outpatients
- visiting high-risk settings such as hospitals or aged care facilities

The need for routine testing in these circumstances should be assessed case-by-case, giving consideration to the associated level of risk.

Post-testing instructions and isolation requirements for suspect cases

The following post-testing instructions apply for suspect cases and individuals who have undergone enhanced testing in jurisdictions with low or no community transmission.

1. Symptomatic people who are not contacts of a confirmed case should stay at home until they receive a negative test AND their symptoms resolve, regardless of vaccination status.
2. Symptomatic people who have tested for SARS-CoV-2 and are contacts of a confirmed case should stay at home or remain in quarantine for the period set by the PHU, regardless of negative test result.

See Additional contact management considerations for guidance on quarantine and testing of contacts in jurisdictions with low or no community transmission.

If the test results come back positive – see Case management.

Additional contact management considerations

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. In low or no community transmission settings, where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) may be undertaken. This is particularly important when the public health aim is to identify all potential unrecognised chains of transmission and the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing may be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case. PHUs may consider following up any person who in that period who had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts may be screened for possible symptoms and be tested for SARS-CoV-2 infection with a PCR test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing may be considered for potential source contacts who are unvaccinated and asymptomatic (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive via PCR or (for unvaccinated individuals) a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain. Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Alternative primary close contact definition

In jurisdictions with low or no community transmission, PHUs may use the following expanded definition of a primary close contact, as a precautionary measure (resourcing permitting).

A primary close contact is defined as a person who has:

- had face-to-face contact with a confirmed case during their infectious period; or
- shared a closed space with a confirmed case during their infectious period, where there is reasonable risk of transmission based on a risk assessment performed by the PHU, taking into account:
    - transmission having been proven to have readily occurred in this (or a similar) setting;
    - the specific variant of SARS-CoV-2;
    - the adequacy of air exchange in an indoor environment; or
    - the nature of the exposure (e.g. type of contact, mask use, whether shouting or singing, size of venue etc.).

Note that:

- The infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered, at the discretion of the PHU.

Alternative management of primary close contacts

PHUs in jurisdictions with low or no community transmission may request primary close contacts to do the following actions, regardless of vaccination status:

- Quarantine for 14 days following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- Monitor their health. PHUs may conduct active daily monitoring of primary close contacts for COVID-19 symptoms for 14 days after the last possible contact with a confirmed COVID-19 case. This includes SMS contact.
- Get tested during the quarantine period (see below).

Advise primary close contacts on the processes for seeking medical care, including how to safely seek COVID-19 testing if they develop symptoms. Refer to Medical care for quarantined individuals.

In jurisdictions with low or no community transmission, testing of primary close contacts may occur:

1. If COVID-19 symptoms develop
2. On entry to quarantine
    - A positive test result would make the primary close contact a case and support an earlier decision to move the person to an alternative place for isolation and bring forward contact tracing for that person.
3. Before exit from quarantine

- A positive test result late in the quarantine period (e.g. day 10–13), prevents the release of potentially infectious people into the community.
- In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.

4. Mid-quarantine (where appropriate)
    - If there is reason to doubt compliance with quarantine or high risk of the primary close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Identification of casual contacts

In jurisdictions with low or no community transmission, and at the discretion of the PHU, there is likely to be some utility in following up casual contacts in addition to close contact as a precautionary measure (resourcing permitting).

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a close contact.

In jurisdictions with low or no community transmission, and at the discretion of the PHU, some casual contacts may be reclassified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to individuals who do not meet the close contact definition.

The following factors may be considered prior to reclassifying casual contacts as primary close contacts:

- Epidemiological context, including level of community transmission.
- The specific variant of SARS-CoV-2.
- The potential for large scale amplification in the given setting or venue
- Jurisdictional capacity and resourcing requirements, including opportunity costs of managing them as close contacts
- Feasibility and resulting impacts of public health measures on essential services (e.g. provision of health care services)
- Vulnerability of the contacts.

Depending on the above factors, PHUs may implement a range of options for management of casual contacts in different settings.

Management of casual contacts

Quarantine and testing requirements for casual contacts

Fully vaccinated casual contacts	Unvaccinated or partially vaccinated casual contacts
1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events) • At a minimum, fully vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required. **2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • Casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.	**1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events)** • At a minimum, unvaccinated or partially vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required. **2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • Unvaccinated or partially vaccinated casual contacts may be requested to enter into quarantine, depending on the local epidemiology. If quarantine is indicated, a shorter term quarantine until around 5 days after exposure is appropriate. • They should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • If quarantined, the unvaccinated casual contact may exit quarantine once a negative day 4-6 PCR result is returned. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.

Note: For guidance on management of casual contacts who are workers in healthcare settings, see Appendix D.

Identification of secondary close contacts

In jurisdictions with low or no community transmission, and at the discretion of the PHU, there may be some utility in following up secondary close contacts as a precautionary measure (resourcing permitting).

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact or shared a closed space in any setting with a primary close contact of a COVID-19 case, from 24 hours after the primary contact's exposure to the case.

Identification of secondary close contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Management of secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHUs may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. lives with the case, exposed at a high-risk setting where transmission has already occurred);
- The secondary close contact is unable to remain isolated from the primary close contact (e.g. one is a carer for the other or lives in the same household);
- There will be a delay in confirming the initial case or commencing contact tracing;
- Secondary transmission has already occurred from a primary close contact to a secondary close contact;
- There are communication challenges with close contacts; or
- The consequences of the secondary case being positive is deemed very high risk (e.g. returning to a remote community).

Secondary close contacts may be quarantined until the PHU has confirmed that the primary close contact was not infectious at the time of last contact with the secondary close contact.

Household secondary close contacts

PHUs may require household secondary close contacts to quarantine until the primary close contact is cleared from quarantine.

Non-household secondary close contacts

PHUs may require secondary close contacts who are in a different household to the primary close contact to remain in quarantine until 14 days from the last exposure of the primary close contact to the confirmed case.

Alternatively, PHUs may require these secondary close contacts to remain in quarantine until there is confirmation that the primary close contact was not infectious at the last time of contact with the secondary close contact (e.g. if the primary close contact tests negative).

Appendix C: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHUs should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHUs are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHUs should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHUs should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be close contacts. These include, staff, residents (if relevant) and visitors.

PHUs may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHUs should ensure all close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHUs may also require secondary close contacts or casual contacts to quarantine.

I. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

I. Assess and record vaccination status

During outbreak investigations, it is important for PHUs to assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities*. While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.

Detailed information on environmental cleaning and disinfection in health and residential care settings is in the *COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet*. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a) With each round of testing, those who are PCR positive can be removed to positive cohort isolation wherever possible.
b) In subsequent rounds, only those who are PCR negative (i.e. those who may be susceptible) should be tested.
c) Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort on Retest Day/s**
Recommended testing and actions	Who to test Test all members of the setting via PCR. Actions Isolate positive persons (may designate an area to cohort positive cases). Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	Who to test Re-test PCR negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. Actions Isolate positive persons Quarantine cohort of PCR negative residents and screen for symptoms. Where possible, people who initially test negative should be quarantined separately.	14 day quarantine starts from date that the quarantine cohort are PCR negative	If any of the quarantined cohort are positive: 1. Recommence 14-day quarantine period 2. Consider retesting every 72 hours until no new PCR positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring PCR positive individuals to a suitable hospital or hospital-equivalent setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for PCR positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHUs should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix D: Work Permissions and Restrictions Framework for Workers in Health Care Settings

This framework supports safe decision making when determining whether to place work permissions/restrictions, independent of quarantine, on a worker after a COVID-19 exposure in a health care setting in the context of an outbreak and community transmission of COVID-19.

Workers in health care settings include a broad array of workers including public, private, and primary care health settings. This includes workers in:

- Public health settings (e.g. public hospitals, public health clinics, ambulance services, and patient transport services)
- Private health settings (e.g. private hospital, day procedure centre or specialist outpatient services)
- Private provider facilities (e.g. general practitioners, private nurse offices, community pharmacies, consulting offices)
- Education settings in which health care students are managed to undertake placement, registration and/or internships in clinical settings

This also includes disability care workers and residential care workers, and associated students within these settings.

Health care services should apply a broad hierarchy of control framework to minimise and manage the risk of transmission of COVID-19. A system-based risk managed approach that applies appropriate mitigations reduces the risk of exposure in health care settings. However, it is acknowledged that risk cannot be eliminated and that exposures will occur.

Health services, supported by the local PHU, are responsible for considering when work permissions and restrictions are required. Health Services and Jurisdictional Departments of Health are also responsible for operationalising these guidelines including defining the reporting and escalation requirements (e.g., if multiple health services are involved) internally.

Work permissions and restrictions framework (the Framework)

The Framework provides a process and tools to support exposure assessment, work restriction and return to work decision making for workers in health care settings. The Framework is designed for workers in health care settings who have had an individual risk assessment completed after exposure to suspect or known COVID-19 case within a health care setting.

Health care managers are encouraged to be familiar with the Framework and additional jurisdictional requirements. Where possible, identify appropriate contacts to be involved in assessment teams in advance and consider training in relation to the Framework. Consider locally applying a process of monitoring and evaluation, in line with jurisdictional requirements.

The Framework includes three steps:

1. Undertake an individual risk assessment for workers in health care settings after potential exposure to a suspect or known COVID-19 case within the health care setting.
    - Assessment is conducted by appropriately trained and skilled local teams from health service providers and residential care facilities (including disability services) in collaboration with the PHU and other specialties where available and required (e.g. Infection Prevention and Control (IPC) Units, Work Health and Safety Units, Infectious Diseases Physicians).
    - Consultation should include hospital and health service operational managers, where relevant, to provide guidance on staff dynamics, workplace layouts, staffing pressure and other factors as required
    - Tools to assist the assessment at this stage are available at:
        - Table 1 – Workers in health care settings exposure risk matrix for workers who are fully vaccinated for COVID-19
        - Table 2 – Workers in health care settings exposure risk matrix for workers who are unvaccinated or partially vaccinated for COVID-19
        - Table 3 – Personal Protective Equipment (PPE) breach risk assessment and actions
2. Determine the potential impacts of work restrictions on the safe ongoing management of the health service.
3. Once exposure risk is determined in the context of the facility and work impacts, refer to the recommended work permissions and mitigations action matrix.
    - Tools to assist the assessment at this stage are available at:
        - Table 4 – Recommended work restrictions and permissions as determined by risk.

Once these steps have been completed, the health service should work with the worker and supervisor to implement appropriate actions. These actions should be in line with public health policy and directives from the Chief Health Officer. Where final actions deviate from the recommended work restrictions and permissions (Table 4), this must be approved by the relevant delegate or Chief Health Officer.

Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review a worker in a health care setting's work restrictions and permissions to facilitate continuation of essential health services.

STEP 1: Undertake an individual risk assessment of affected workers in health care settings and determine level of exposure

Factors to be considered when undertaking an individual risk assessment are:

Details of exposure event (type, dose, time):

- Case details (infectious period, transmission risk, behaviour's, vaccination status, information on viral load (CT values) if available)

- Type of exposure: types of care or potential behaviours that increase the risk of COVID-19 transmission
- Details of related transmission events in the outbreak
- Amount of cumulative time the worker has occupied the same shared space as the case including type and proximity
- Vaccination status: unvaccinated, partially vaccinated, fully vaccinated
- Staff mobility: Work across multiple facilities highly mobile within the facility, work in high-risk area.

Details of mitigations in place:

- Vaccination status of the worker (unvaccinated/ partially vaccinated/ fully vaccinated)
- PPE and IPC: correct use of appropriate PPE and IPC precautions by the case and worker

Risk assessments should be made on a case-by-case basis by local health service staff in consultation with the PHU and other relevant staff. In most circumstances, exposure risk should be determined using the appropriate health care worker exposure matrix based on vaccination status (Table 1 for fully vaccinated OR Table 2 for partial or unvaccinated).

In some circumstances, the exposure matrices provide an option of moderate or high risk, to reflect that a qualitative assessment is required to determine the appropriate level of exposure. In other circumstances, the matrix provides a clear indication of the exposure risk, however this remains subject to a case-by-case assessment. For example, in circumstances where the worker in a health care setting is immune-compromised, it may be necessary to increase the risk profile (e.g., a fully vaccinated worker may be assessed using the unvaccinated risk matrix).

Final decisions should be informed by a qualitative assessment considering variety of factors, as outlined in Steps 2 and 3. Once a risk assessment, based on the above considerations, has been conducted, it is important to characterise the situational context of the exposure to help understand the impact of a potential transmission event and whether situational factors may further mitigate or increase the level of exposure and associated risk.

Factors to consider when characterising the situational context:

- Type of work location, role, and environment (e.g., use of shared equipment, shared/communal spaces, high risk setting/persons, whether indoors or outdoors, level of vaccination coverage of workers in a health care setting)
- Other workplace mitigations in place during time of potential exposure (physical barriers, negative pressure rooms, ventilation characteristics in the relevant rooms/spaces and additional HEPA air filtration)
- Vulnerability of population (workers in health care setting and patients)
- Additional controls and residual risk of transmission in the setting (e.g. daily testing programs).

Based on these situational factors, the assessment team should consider whether the exposure risk should be amended and the worker's level of exposure risk reclassified. This will inform the final individual risk assessment, prior to moving to Step 2.

STEP 2: Assess the impacts of the work restrictions

Health services and their IPC staff, with support of PHUs, are responsible for operationalising and tailoring this guidance. This may involve consultation with other specialties where available, such as Work Health and Safety units and Infectious Diseases Specialists. While this framework cannot capture all the nuance and influential factors that may arise, the framework notes that there will be circumstances in which it is not possible to apply the recommended work permissions and restrictions as determined by the level of risk (outlined in Step 3).

In determining the final work restrictions and permissions for a staff member, the impact of these restrictions on the health services must be assessed. For example:

- If the majority or all staff in a highly specialised area are exposed
- If in a rural or regional setting where only a few staff members possess specialised skills
- If the health care service has a significant caseload without additional staff to engage.

In the first instance, health services should consider whether staff furlough can be compensated through rostering arrangements. Where possible, staff members requiring quarantine or furlough should be removed from the roster or replaced for their furlough/quarantine period.

Where this would significantly impact on the ongoing safe delivery of services, alternative rostering arrangements should be considered. This may involve:

- Redeployment of staff (e.g., accessing staff from other areas of a facility or bringing staff in from other facilities to fill roster gaps)
- Reducing hours of service operation if this can be managed whilst safely providing essential services
- Diverting patients to another facility, where this can be safely managed without overwhelming other essential health services
- Reducing the scope of service provision to only provide the highest priority care (e.g., delaying non-critical services)

Where these actions are not possible or would result in a significant disruption of essential services, it may be necessary to implement alternative mitigations so that staff members may continue working and providing essential services (see Step 3). In these circumstances, if the workforce impact is considered critical, health care services should work with the PHU to ensure their unique circumstances are considered and that appropriate mitigations are implemented (see Step 3).

STEP 3: Once exposure risk is determined, refer to the recommended work permissions and restrictions action matrix

After undertaking an individual risk assessment (Step 1) and considering impacts of work restrictions (Step 2), the assessment team should allocate a ‘risk assessment outcome’ to the worker (low, low to moderate, moderate or high). Based on the risk assessment outcome, the assessment team should consider the recommended work permission and restrictions, taking into account the impacts of these restrictions for the health care setting.

Where a worker is assessed as moderate or high risk, the PHU may recommend they undertake a period of quarantine. Where possible, workers who are advised to quarantine should complete the required quarantine period and should not attend work whilst in quarantine. However, noting that this may not be possible due to work requirements (as identified in Step 2), it may be necessary to implement mitigations so that workers may continue to work or have a reduced quarantine period.

In some circumstances, these arrangements may result in a worker who is in quarantine due to being a close contact being able to work (pending results of PCR testing) prior to being released from quarantine. This may be necessary due to substantial workforce impacts associated with the worker needing to quarantine. Workers should adhere to the guidance of the PHU. In some cases, this may involve attending work with appropriate mitigations, however being restricted from movements within the community.

The minimum recommended work permissions and restrictions for workers based on their risk assessment outcomes are outlined in Table 3. Final work permissions and restrictions should be determined in a case-by-case basis, in line with jurisdictional requirements. Additional mitigations may include:

- Daily or more regular screening requirements
- Daily testing requirements
- Additional PPE requirements
- Minimising risk of exposure to vulnerable people
- Adjusting staff rosters to minimise risk to patients and/or exposure of other staff (e.g., exposed workers tending to COVID-19 cases)

In determining the recommended work permissions and restrictions, the assessment team should also consider the work environment and individual circumstances of the worker. Adjustments to work permissions and restrictions may be required, and in some circumstances, this may involve adjusting the minimum requirements as outlined in Table 3. For example, in regional settings it may not be feasible to require daily saliva testing (recommended for high risk). In these circumstances, the assessment team may consider removing this requirement or implementing alternative arrangements.

Where the final recommended work permissions and restrictions deviate from the recommended minimum requirements (Table 4), this must be approved by the relevant delegate or Chief Health Officer. Decisions regarding the recommended work permissions and restrictions for the worker in a health care setting should be carefully documented. Decisions should be regularly reviewed in the context of the evolving local epidemiological and public health situation. If an outbreak escalates, it may be necessary to review the recommended restrictions to facilitate continuation of essential health services.

Table 1: Workers in health care settings exposure risk matrix – Fully vaccinated for COVID-19

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)		**EXPOSURE EVENT SCENARIO#**			
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.	
PPE WORN BY STAFF& CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Low to Moderate Risk	Moderate Risk	High Risk	
	Staff: Surgical mask only Case: No surgical mask	Low Risk	Low to Moderate Risk	High Risk	
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low Risk	Low to Moderate Risk	Moderate Risk Depending on risk assessment	High Risk Depending on risk assessment
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low Risk	Moderate Risk Depending on risk assessment	High risk Depending on risk assessment
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk	Low to Moderate Risk Depending on risk assessment	Moderate Risk Depending on risk assessment
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk	

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 2: Workers in health care settings exposure risk matrix – Unvaccinated or partially vaccinated for COVID-19

Note: Mandatory vaccination requirements for workers in health care settings will be set by jurisdictions.

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

	NB: All exposure category decisions are based on a local risk assessment Case = Any confirmed positive case of COVID-19 (co-worker, patient, or other)	**EXPOSURE EVENT SCENARIO#**		
		Low Risk Scenario: Transient, limited and distanced contact that does not meet the definition for face-to-face or close contact.	**Medium Risk Scenario**: Transient face-to-face contact with a confirmed case **OR** Non-transient distanced contact in an indoor space.	**Highest Risk Scenario**: Providing direct care to a case **OR** Non-transient face-to-face contact with a confirmed case **OR** Prolonged/cumulative contact in the same enclosed/confined space **OR** Where the types of care or potential behaviours increase the risk of COVID-19 transmission **OR** Contact with multiple COVID-19 cases.
PPE WORN BY STAFF & CASE DURING EXPOSURE	Staff: No effective PPE Case: With or without mask	Moderate Risk	Moderate Risk	High Risk
	Staff: Surgical mask only Case: No surgical mask	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	Moderate Risk	High Risk
	Staff: Surgical mask + eye protection* Case: No surgical mask	Low to Moderate Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask only Case: Surgical mask§	Low Risk	Low to Moderate Risk Depending on risk assessment / Moderate Risk Depending on risk assessment	High Risk
	Staff: Surgical mask + eye protection* Case: Surgical mask§	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Depending on risk assessment	High Risk
	Staff: P2/N95 + eye protection* Case: With or without surgical mask	Low Risk	Low Risk Case: Surgical mask / Low to Moderate Risk Case: No mask	Low to Moderate Risk No prolonged/ cumulative/ physical contact / Moderate Risk Prolonged / cumulative/ physical contact
	Staff: Full PPE – P2/N95, eye protection, gown, gloves; no breaches Case: With or without surgical mask	Low Risk	Low Risk	Low Risk

* If gown/apron or gloves were also worn during the exposure event, this should be documented and may be factored into the exposure event risk assessment.

§ Incorrect mask use is to be considered the same as 'no surgical mask'. For cases, P2/N95 mask use to be considered the same as surgical mask.

Documented risk assessment for all exposure events should include evaluation of occupational exposures and of the space (including size and ventilation, where possible).

Table 3: PPE breach risk assessment and actions

Note: This table represents minimum national recommendations. Jurisdictions may implement additional requirements above these minimum national recommendations.

Determine level of exposure		Immediate actions	Actions once risk confirmed
LOW RISK BREACH	• Breaches in PPE that occur below the neck and are managed immediately (e.g., torn glove)	• Remove from situation • Remove PPE • Perform hand hygiene • Inform line manager	Follow actions for low risk as outlined in Table 4: Recommended work permissions and restrictions.
MODERATE RISK BREACH Increased risk of infection	• Incorrect use of PPE • Incorrect PPE for task • Contamination occurs during doffing (occurs above neck)	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Screening/testing • Continuous monitoring	Follow actions for moderate risk as outlined in Table 4: Recommended work permissions and restrictions.
HIGH RISK BREACH Likely risk of infection	• Exposure of mucous membranes by direct droplets from confirmed COVID positive (e.g., spitting in HCW face by confirmed COVID case) • Contamination occurs during doffing	• Remove from situation • Remove PPE • Perform hand hygiene/flush site or relevant care • Inform line manager • Closely monitor • Screen/test • Remove from immediate duties	Follow actions for high risk as outlined in Table 4: Recommended work permissions and restrictions.

Table 4: Recommended work permissions and restrictions as determined by risk

Note: This table represents minimum national recommendations, noting that adjustments may be made based the individual assessment (step 1) and consideration of impacts (step 2). Jurisdictions may implement additional requirements above these minimum national recommendations.

	RISK LEVEL			
	LOW RISK	**LOW TO MODERATE RISK**	**MODERATE RISK**	**HIGH RISK**
Work restrictions	Continue to work.	Continue to work.	Isolate until Day 2 RT-PCR test. If test result negative can return to work. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.	**Work restrictions** **Leave workplace immediately**. **Isolate** as a close contact **Potential to return to work early** if Day 5 test result is negative. Whilst at work, restricted from break rooms and other locations where there is potential to remove mask. Recommended to eat or drink in a separate designated area.
Testing	Be alert to mild symptoms, test if symptomatic	**Day 2 RT-PCR** test **Day 5 RT-PCR** test.	**Day 2 RT-PCR** test If test result negative may return to work. **Day 5 RT-PCR** test **Day 13 RT-PCR** clearance test.	**Day 2 RT-PCR** test. **Isolate**. **Day 5 RT-PCR** retest. **Isolate while result pending**. **Day 13 RT-PCR** clearance test.
	Any staff who develop symptoms must get a throat-nose swab and **isolate** until their result is known and symptoms have resolved.			
Return to work	N/A	N/A	**Work permissions. If Day 2 test is negative may return to work.** Workplace to consider need for additional surveillance testing; Daily or less frequent saliva testing.	**Work permissions. If Day 2 test and Day 5 test are negative**, may return to work at a single site, with additional surveillance testing; daily saliva tests and; **RT-PCR** retest **day 9 and 13.** Additional: - Be alert to mild symptoms - Test if symptomatic - Limit work to a single site/area.
Additional PPE Requirements on return to work?	**Wear a surgical mask at all times for 14 days post-exposure** in indoor spaces including staff only spaces, unless eating/ drinking.	**Wear a surgical mask at all times for 14 days post-exposure** in indoor spaces including staff only spaces, unless eating/ drinking. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times for 14 days post-exposure** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT-PCR test.**	**Wear a surgical mask at all times for 14 days post-exposure** in indoor spaces including staff only spaces. Continue until clearance following **Day 13 RT PCR test.**
Work across sites?	**In general, Yes**. Inform all employers of cross-site details.	**In general, Yes**. Inform all employers of cross-site details.	**No.** Consider limiting work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work in with vulnerable persons.	**No.** Limit work to a single site/area. Exclude from work with high risk patients, where possible (E.g. oncology wards). **Consider redeployment** if work is with vulnerable persons.
	If there is an outbreak at a workplace—i.e. if there is previously demonstrated transmission—even low-risk exposures should limit work to a single site.			
	Workers in COVID Streaming Areas must follow any jurisdiction workplace directions from the Chief Health Officer.			

Appendix E: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew close contacts. For more information on contact tracing of aircraft passengers see Close Contacts- Aircraft passengers and crew.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a close contact:
    - Face-to-face contact with a confirmed case during their infectious period.
    - Shared an aircraft section (for at least 1 hour) with a confirmed case during their infectious period.
    - Direct contact with the body fluids (e.g. used tissues) of a confirmed case in the absence of wearing recommended PPE or if there was a failure of PPE.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHUs should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as close contacts.

Additional considerations for conducting a risk assessment should include:

1. **Variants of concern**
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

2. **Proximity of crew to confirmed cases**
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. **Duration of exposure to confirmed cases**
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

4. **Size of the compartment in which the crew and confirmed case interacted**
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered close contacts.

5. **The number of confirmed cases of COVID-19 on board**
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. **Potential breaches of PPE**
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

Aircrew and passengers who are close contacts

If an airline becomes aware of a crew member or passenger who was a close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix F: Guidance on the management of aircrew.

Appendix F: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Aircrew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 PCR test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the PCR test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive PCR test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix G: Full revision history of the COVID-19 SoNG

Revision history

Version	Date	Revised by	Changes
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations

Version	Date	Revised by	Changes
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.

Version	Date	Revised by	Changes
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.

Version	Date	Revised by	Changes
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.

Version	Date	Revised by	Changes
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.

Version	Date	Revised by	Changes
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 6.3

24 December 2021

Summary of revision history

For full revision history, refer to Appendix F

Version	Date	Revised by	Changes
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the *WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020*.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the *Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses*.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for COVID-19. Jurisdictions may adapt this guidance based on local epidemiological context.

Updates to this guideline reflect community transmission in some jurisdictions and Australia's progress through the *National Plan to transition Australia's National COVID-19 Response*. See Appendix B for additional considerations for jurisdictions with low or no community transmission. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

For detailed guidance on infection prevention and control, refer to *Infection Control Expert Group (ICEG) endorsed infection prevention and control guidance*.

Public health priority

Urgent – initiate public health responses as soon as possible. Public health responses may be automated and prioritised to assist with maintaining public health workforce capacity.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status.

Hospitalised confirmed cases should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of confirmed COVID-19 patients, including personal protective equipment (PPE), *see ICEG-endorsed infection control guidance*.

Historical cases do not need to isolate and public health units (PHUs) do not need to follow up their contacts.

Contact management

PHUs should manage close contacts according to management of contacts guidance.

Vaccinated close contacts must quarantine for 7 days following last close contact with the confirmed case during their infectious period. Unvaccinated or partially vaccinated close contacts must quarantine for 14 days following the last close contact with the confirmed case during their infectious period. Close contacts should monitor for development of fever or COVID-19 symptoms during this period, where feasible, and test for SARS-CoV-2 if symptoms develop.

2. Key definitions

Low or no community transmission

Low or no community transmission, in this guidance refers to infrequent or no COVID-19 cases acquired within a PHU's geographic area of responsibility.

Community transmission

Community transmission, in this guidance refers to when there are multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction.

Fully vaccinated person

Fully vaccinated refers to a person who is ≥14 days following receipt of the final dose of a primary course of COVID-19 vaccine approved or recognised by the Therapeutic Goods Administration (TGA)[1].

Partially vaccinated person

Partially vaccinated refers to a person who has received at least one dose of a COVID-19 vaccine registered by the TGA but does not meet the definition of a fully vaccinated person.

Reinfection

A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed COVID-19 that is determined to be a separate episode to the first based on epidemiological and/or laboratory findings. SARS-CoV-2 RNA detection must be greater than 1 month after the first laboratory confirmed infection to be considered reinfection. Wherever feasible, whole genome sequencing should be undertaken for suspected reinfections.

Breakthrough infection

A confirmed episode of SARS-CoV-2 infection in a fully vaccinated person > 14 days following their final dose of a primary course of COVID-19 vaccine.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

[1] There may be differing operational definitions of fully vaccinated in jurisdictions and for purposes of international travel.

3. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. In 2021, the SARS-CoV-2 Delta variant became the predominant variant of the virus in Australia.

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (1).

Mode of transmission

SARS-COV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (2). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (2).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings, in the context of certain behaviours, such as singing and shouting (3) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (2). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (4, 5). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (6).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of early SARS-CoV-2 variants ranged from 2–4 (7). R_0 for confined settings were potentially at the higher end of this range. The Delta variant of SARS-Cov-2 is more transmissible than previously identified variants with infectiousness nearly twice that of the historical variant (8).

Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (9, 10).

SARS-CoV-2 variants of concern or interest

As the pandemic progresses SARS-CoV-2 variants continue to emerge. Some variants are classified as 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (11, 12).

As VOC are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, disease severity, vaccine efficacy, immunity after previous infection, incubation period, and infectious period. These factors have implications for public health measures necessary to protect the community and the health system. There may be a delay between the identification of cases in Australia who are infected with a new VOC, and the availability of data and evidence to guide appropriate public health interventions. Where there are emerging VOC with uncertain viral characteristics, it is prudent for jurisdictions to consider a more conservative approach to case and contact management, such as increased testing, isolation and quarantine requirements until more is known about the VOC and its epidemiological and clinical implications. More conservative public health and social measures may also be considered during this time. Depending on the characteristics of the virus, these measures may remain in place, even once the epidemiological and clinical implications are known.

Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

The Communicable Diseases Genomics Network (CDGN) actively monitors variants and their reported mutations to understand how they influence the behaviour of the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see *ICEG-endorsed infection control guidance*.

Incubation period

Prior to the emergence of the Delta variant, the median incubation period for people who became symptomatic was 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (13-15). Around 1% of COVID-19 cases developed symptoms more than 14 days after exposure (16). Evidence for the Delta variant incubation period is still emerging, however some studies suggest it may be shorter than other lineages (17, 18).

There is currently limited evidence to determine how the incubation period for breakthrough infection in vaccinated individuals may differ from infection in unvaccinated individuals.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (19, 20). Pre-symptomatic transmission can occur 1-3 days before symptom onset (21, 22). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (23).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (20). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (23). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (24).

It has been demonstrated that the Delta variant is associated with higher viral burden and longer duration of viral shedding compared to previous variants of SARS-CoV-2 (25, 26). Currently available evidence suggests that initial viral load is similar between vaccinated and unvaccinated individuals, however some studies have found that vaccinated people have a more rapid decline in viral load than unvaccinated people (27-29).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the PHU. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (30-32). Other symptoms include headache, sore throat, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (30-33). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (34).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. International cohort studies have suggested unvaccinated or partially vaccinated people infected with the Delta variant are more likely to be hospitalised than patients infected with the Alpha variant (35, 36)

Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (19, 20, 37-40). It is unclear at this stage whether the higher viral burden associated with the Delta variant has changed the proportion of asymptomatic infections.

Fully vaccinated people can still become infected though infection is less likely than in someone who is unvaccinated. Disease associated with breakthrough infection is less severe, however, the risk of onward transmission appears to be similar to that for

unvaccinated individuals (41); however the period of infectiousness appears to be shorter in vaccinated cases. Severe disease can still occur in a small proportion of vaccinated people particularly the elderly and those with certain co-morbidities (42, 43).

COVID-19 in children

Acute infection with SARS-CoV-2 is generally associated with mild disease in children, and compared to adults, children have almost 25 times lower risk of severe disease (44, 45). However, however the period of infectiousness appears to be shorter in vaccinated cases. children may be hospitalised for social, rather than clinical, reasons, for example if both parents are too unwell to care for them. A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (46).

Longer term outcomes of COVID-19

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (47). A large systematic review of the body of evidence collected on the post-acute sequelae of COVID found the median proportion of COVID-19 survivors experiencing at least one sequelae was 54% at 1 month (short-term), 55% at 2 to 5 months (intermediate-term), and 54% at 6 or more months (long-term.) (48, 49). In the UK, prevalence of self-reported post-acute sequelae of COVID-19 has been highest in people aged 35 to 69 years, females, people living in more disadvantaged areas, people working in health or social care, and people with disabilities (50).

Case fatality rate

As at 24 December 2021, the crude case fatality rate (CFR) for confirmed cases reported globally is approximately 1.9% (51). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems and patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is less than 1% (based on surveillance data notified in Australia as of 24 December 2021). As of 24 December 2021, 42% (904/2173) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (51).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (51). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (51, 52).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (52). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (52). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Durability of immunity after SARS-CoV-2 infection likely differs significantly from person to person depending upon a range of factors (age, co-morbidities and pre-existing immunosuppression and previous vaccination). Studies suggest a strong immune response after previous infection, with effective natural immunity to future infectious in most individuals (53). However, vaccination continues to provide the best protection against reinfection (54-58).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- Come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including:

- multiple exposure points;
- staff who may have a perceived need to continue work despite being unwell; and
- language barriers for people from culturally and linguistically diverse backgrounds.

Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;

- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

4. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and, as much as possible, disease transmission. It is anticipated that high levels of COVID-19 vaccination coverage will facilitate the progressive winding back of public health and social measures such as travel restrictions and physical distancing.

As of December 2021, the Australian Technical Advisory Group on Immunisation (ATAGI) recommends vaccination for all individuals aged 5 years and over in a two-dose vaccine schedule (3 doses for severely immunocompromised individuals). ATAGI recommends the use of a single booster dose for anyone aged 18 and older who completed their primary COVID-19 vaccine course ≥4 months ago. This will initially include, but not be limited to, groups who were prioritised in the rollout of the vaccine program from early 2021. For more information, see *ATAGI recommendations on the use of a booster dose of COVID-19 vaccine* and *ATAGI recommendations on Pfizer COVID-19 vaccine use in children aged 5 to 11 years*.

The COVID-19 vaccines registered for use in Australia have all been shown to be highly effective against severe disease, including due to the Delta variant (59). Vaccine effectiveness against hospitalisation due to Delta infection has been shown to be 95.2% and 98.4% for Vaxzevaria (AstraZeneca) and Comirnaty (Pfizer), respectively, 2 to 9 weeks following the second dose (59). The effectiveness of these two vaccines against death has been shown to be 94.1% and 98.2%, respectively (59). Existing vaccine safety monitoring systems have been strengthened, with weekly COVID-19 vaccine safety reports provided by the Therapeutic Goods Administration and AusVaxSafety active surveillance system.

Other prevention activities

When combined, prevention and control activities, can help limit the spread of certain respiratory diseases, including COVID-19. These measures may include:

1. Physical distancing and gathering
    - Physical distancing can reduce the potential for transmission. Physical distancing measures may include:
        - maintaining a distance of 1.5m from people
        - density restrictions; and
        - limits on the number of people allowed to participate in an event.
2. Environmental controls, such as optimised ventilation
3. Personal hygiene
    - PHUs should encourage good hygiene practices to prevent SARS-CoV-2 infection including:
        - wearing a face mask where physical distancing cannot be maintained, particularly indoors;
        - staying home if unwell;
        - effective hand and respiratory hygiene; and
        - cleaning surfaces
4. Travel restrictions
    - Some jurisdictions will require quarantine or testing of domestic and international travellers. See *COVID-19 FAQs- international travellers to Australia.*

5. Surveillance

There are five main objectives of surveillance for COVID-19, which are to rapidly:

1. Identify, isolate and manage cases.
2. Identify, quarantine and provide relevant information to contacts.
3. Detect and manage clusters and outbreaks.
4. Characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place;
    - describing the transmission dynamics;
    - identifying groups at special risk of infection or more severe disease; and
    - monitoring for SARS-CoV-2 variants.
5. Monitor the effectiveness of the following routine prevention and control activities, in managing the COVID-19 outbreak over time:
    - vaccination;
    - test, trace, isolate and quarantine processes; and
    - public health and social measures.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed or historical case of COVID-19 or death in an infected person.

As much information regarding the case's age, sex, comorbidities, vaccination status, place of residence, occupation, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be collected, with additional information being followed up based on risk assessment.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

PHUs should enter initial information on confirmed and historical cases of COVID-19 onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enter enhanced surveillance data shortly after case follow-up. Jurisdictions are encouraged to prioritise and automate as many of these processes as possible, including linking COVID-19 cases to clinical services.

Surveillance of variants of concern

Early identification of cases, where there is a high probability of infection with a VOC such as the Omicron variant, can inform appropriate public health responses. Ideally, these VOC are identified through whole genome sequencing. Omicron primary test results with spike gene target failure may indicate probable infection with this variant. Where possible, public health reference laboratories should confirm the infecting strain using whole genome sequencing, although this may not be possible where large numbers of cases are occurring.

Jurisdictions can refer to the *CDGN Laboratory Case Definitions for SARS-CoV-2 Variants of Concern* for more information.

6. Cases

Definitions

Reporting

Notify both confirmed cases and historical cases in the jurisdiction of public health management.

People meeting the confirmed or historical case criteria who were previously diagnosed and managed overseas or in another Australian jurisdiction do not need to be re-notified. In this situation, the person should provide documented evidence of diagnosis overseas or interstate to the PHU.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic acid testing;

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a nucleic acid test;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[1].

Historical case

The historical case definition intends to capture cases who were infected sometime in the past that were not previously reported and are not considered infectious at the time of diagnosis. Further laboratory testing is required to meet this criterion.

A historical case requires:

i. Laboratory evidence to support a historic infection; **AND**

ii. Absence of clinical evidence in the 14 days prior to swab date of positive test

Laboratory evidence for historic infection:

1. For people who have not been vaccinated:
    - Detection of SARS-CoV-2 by nucleic acid amplification (NAA) with initial test results suggestive of a historical infection[2]; **AND**
    - A subsequent NAA is negative OR suggestive of a historical infection[2], taken at least 24 hours apart; **AND**
    - Detection of IgG or total antibody[1];

    OR

2. For people who have been vaccinated:
    - Detection of SARS-CoV-2 by NAA with initial test results suggestive of a historical infection[2]; **AND**
    - A subsequent NAA is negative, taken at least 24 hours apart.

Clinical evidence

- Fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[3]; or
- Loss of smell or loss of taste.

Notes:

[1] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

[2] NAA results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist.

NAA results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms, which may not produce Ct values.

[3] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Testing

Specimen collection and testing for SARS-CoV-2

Nucleic acid testing using reverse transcription polymerase chain reaction (RT-PCR) or transcription-mediated amplification (TMA) is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection. For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; and different types of SARS-CoV-2 specific testing, see *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2*.

Alternative testing methods, including rapid antigen testing for SARS-CoV-2, may be used in specific contexts and settings where pre-test probability is high. See *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests*. PHUs should follow jurisdictional guidance on the use of rapid antigen tests.

See *CDNA and PHLN Testing Framework for COVID-19 in Australia* for guidance on local approaches to testing, including key priority groups based on the likelihood of infection and the epidemiological situation.

Guidance on Personal Protective Equipment (PPE) for specimen collection is available from *ICEG-endorsed infection control guidance*.

Who to test for SARS-CoV-2

It is important to maintain high rates of testing to rapidly detect all infections and identify chains of transmission in the community.

Test the following people:

1. **Symptomatic People**

People who have at least one of the following COVID-19 like symptoms should test for SARS-CoV-2.

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat); or
- Loss of smell or loss of taste.

Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. SARS-CoV-2 testing should be considered when assessing patients presenting with non-specific signs of infection.

2. **Asymptomatic people**

People who have higher risk of exposure to SARS-COV-2 should test for SARS-CoV-2, including:

- International arrivals
- Close contacts of COVID-19 cases
- People who provide care for COVID-19 cases (e.g. Health care workers).
- Domestic and international aircrew
- Workers in managed quarantine facilities

Testing following a possible vaccine-related adverse event

If a vaccine recipient is not a suspect case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

PHUs should consider the local epidemiology in determining whether SARS-CoV-2 testing is necessary in this instance. If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Stay at home requirements after COVID-19 testing

Health care workers providing testing services should clearly communicate the following stay at home requirements after COVID-19 testing:

1. Symptomatic people who have tested for SARS-CoV-2 should stay at home until they receive a negative test, regardless of vaccination status.
2. Asymptomatic people who are not close contacts do not need to stay at home whilst awaiting a negative test result, unless instructed to stay at home by a public health authority.

See Management of Contacts for guidance on quarantine and testing of close contacts.

See Appendix B for additional post-testing instructions for jurisdictions with low or no community transmission.

Assessing indeterminate and suspected false positive NAA results

Australian laboratories use highly accurate SARS-CoV-2 NAA assays and, where required, have procedures in place to confirm test results. Where there is active COVID-19 in the community, the positive predictive value of NAA testing is very high (with the exception of persistent shedding). However, indeterminate or suspected false positive SARS-CoV-2 test results may still occur. PHUs may assess indeterminate or suspected false positive NAA results in order to avoid unnecessary isolation of cases, quarantine of contacts, and strain on public health resources.

Indeterminate or inconclusive NAA results

Indeterminate results may occur due to low viral loads; persistent shedding; or non-SARS-CoV-2 reactivity in the NAA test. In these circumstances, PHUs should contact the laboratory microbiologist to discuss the results and decide whether further testing is

required. Consider results in the context of the clinical and epidemiological circumstances to inform whether further public health action is required.

PHUs can use the below actions for suspected false positive NAA results to determine whether to manage the person with indeterminate NAA results as a COVID-19 case.

Suspected false positive NAA results

PHUs might suspect a false positive SARS-CoV-2 NAA result when there are no epidemiological risk factors for COVID-19. This is particularly relevant for jurisdictions with low or no community transmission with high levels of enhanced testing.

If a false positive NAA result is suspected, PHUs should contact the laboratory microbiologist to obtain more details of the test results before designating the result a false positive. The laboratory microbiologist will investigate whether there is evidence of laboratory error or non-specific reactivity in the NAA test, and ascertain whether further testing of the sample is required. If further laboratory investigations provide convincing evidence the case is negative, the test may be considered a false positive and the laboratory will issue an amended report.

For more information on the possible sources of false positive NAA test results, see *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

Further PHU actions for suspected false positive NAA results

PHUs should conduct further assessments (in close collaboration with the laboratory microbiologist and treating clinician) for suspected false positive results.

Consider a case conference with experienced public health practitioners, the microbiologist and the treating clinician. In some jurisdictions, there may already be established panels for this purpose. Where there is uncertainty or difficulty reaching agreement on whether the NAA is a false positive, assess the risks associated with missing a true COVID-19 case.

PHUs should:

1. Continue all relevant public health action, including case isolation and contact tracing, until the test is determined to be a false positive.
2. Thoroughly review the case's clinical history (including for mild/atypical symptoms, delayed onset of symptoms, history of compatible illness) and potential epidemiological links. Consider the likelihood of true asymptomatic infection, pre-symptomatic infection, mildly symptomatic infection, and previous infection with persistent viral shedding.
3. Immediately collect another respiratory specimen for NAA testing, where feasible.
4. Consider testing close contacts, starting with those who have had the most regular and prolonged contact (e.g. household contacts).
5. Record the results of the investigation, including relevant laboratory information following discussion with the microbiologist, into a standard report.

PHUs can cease all public health interventions once a NAA result is confidently considered false positive. If the case is included in jurisdictional and national reporting, PHUs should take necessary actions to reverse this.

Case management

Response times

Confirmed cases:

Begin follow up investigation of confirmed cases as soon as practicable and, where applicable, notify your central state or territory communicable diseases unit. Complete case interviews, exposure site identification and close contact identification within 1 day of notification of a confirmed case. Jurisdictions may choose to prioritise cases for follow up and automate many of these case management processes.

PHUs should ensure that staff are available to contribute to the expert assessment of patients under investigation on hospital clinician or general practitioner request.

Historical cases:

Confirmed historical cases do not need to isolate and PHUs do not need to follow up their contacts.

Response procedure

Genomic sequencing

Genomic sequencing is an important part of SARS-COV-2 surveillance and can be used to monitor transmission dynamics, identify lineages of concern, and inform outbreak investigation and public health response.

Jurisdictions have varying capacities to conduct whole genome sequencing. In jurisdictions where community transmission is established, it may not be justifiable to attempt to sequence every COVID-19 case. In these situations, PHUs should employ prioritisation strategies based on their jurisdiction's epidemiological context, capacity and priorities. This approach balances the costs and benefits of real-time SARS-CoV-2 genomic surveillance, where there is rapid spread of a dominant variant.

The *CDGN, PHLN and CDNA Sampling strategy for SARS-CoV-2 genomic surveillance* provides guiding principles and outlines an approach to selective and targeted sequencing. This includes guidance on priority groups for targeted sampling (e.g. international travellers).

For further information, see:

- *PHLN guidance on laboratory testing for SARS-CoV-2*
- *Testing Framework for COVID-19 in Australia*
- *Australian National Disease Surveillance Plan for COVID-19*

Case investigation

Ideally, PHUs should respond to COVID-19 case notifications as soon as possible via a case interview. However, where public health capacity is exceeded, PHUs may choose to automate and prioritise case investigation processes (e.g. SMS based questionnaires). This may include automated surveys to collect only essential information that will assist with risk stratification, prioritisation of cases for public health follow up and surveillance. Priority cases may include people in high-risk settings or situations.

PHUs can use Appendix A- COVID-19 PHU checklist and their state or territory COVID-19 case report as a guide for case investigation.

PHUs should ensure the following actions have taken place for each case:

- Isolate the case and confirm their last day in community
- Confirm any symptoms of the illness and the symptom onset date
- Confirm relevant pathology test results and any additional tests required, including repeat tests where relevant.
- Record vaccination status including vaccine type, dosage, date and country of administration.
- Review both case and contact management.
- Commence or complete contact tracing, aiming to place close contacts in quarantine within 48 hours of specimen collection from the case.
- Determine if the case has attended settings that are at higher risk for transmission.
- Ensure appropriate infection control guidelines are followed in caring for the case.
- Where possible, identify the likely source of infection.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. For further advice on clinical management, see:

- WHO: https://bit.ly/3eKZQs3
- National COVID-19 Clinical Evidence Taskforce: (https://covid19evidence.net.au/)
- Cochrane Library: Coronavirus (COVID-19): (https://www.cochranelibrary.com/covid-19)

Prophylaxis against severe disease:

Proactive use of monoclonal antibody therapy in people at high risk of developing severe disease may help prevent hospitalisation if it is administered within the first five days of developing symptoms. PHUs, in conjunction with the local clinical team, can help identify cases for clinical treatment early. For further information on emerging clinical treatments, see *National COVID-19 Clinical Evidence Taskforce*.

Education

PHUs should educate cases about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Hospitalised COVID-19 patients

To minimise the risk of transmission from hospitalised COVID-19 patients, PHUs should encourage hospitals to undertake a system based risk assessment. Hospitals can manage risk by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).

- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Hospitalised confirmed cases should be isolate in a negative pressure room with anteroom, where available. If a negative pressure room is not available, the hospitalised case can isolate in a standard isolation room or single room with negative airflow as an alternative. Avoid rooms with positive pressure airflow.

If there is concern about a potential exposure related to a hospitalised case, PHUs should undertake a risk assessment on hospital staff, visitors or other patients to determine whether further public health response is required (See Health and residential care workers).

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Isolation and restriction

Depending on clinical indication, cases should either be managed in hospital (see above), at home, or other community residential settings identified by the PHU. Cases can isolate at home or in a community setting only if:

- a risk assessment is conducted regarding the suitability of the accommodation and living arrangements, including who else is in the home and their vulnerability to severe disease;
- it can be assured that the home environment permits separation of the case from other household members;
- the case and household contacts are counselled about risk, and appropriate infection control measures are in place; and
- there is a reasonable level of confidence of the compliance of the case.

Release from isolation

Historical infections for which further isolation is not required

Some people who are asymptomatic, such as international travellers, may test positive on NAA testing during their quarantine period, but their infection may have occurred previously and be ‘historic’ rather than acute. Similarly, occasionally a person may have a NAA result suggestive of a historical infection, and this result may be positive only on a subset of gene targets in the NAA assay/s used. These scenarios might be due to acute infection but could also represent previous infection (i.e. intermittent/persistent SARS-CoV-2 shedding in a historical case), sometimes with a concurrent upper respiratory tract infection due to another pathogen.

An additional swab collected at least 24 hours after the initial positive sample and serology testing can assist in distinguishing an acute from a historical COVID-19 infection. If the person is symptomatic, testing for other respiratory pathogens should be performed.

PHUs should use the following criteria to determine if a person has had a historical infection. There is no public health need for further isolation or management of contacts:

1. NAA results suggestive of a historical infection[1] on two specimens[2] collected at least 24 hours apart, **OR** an initial NAA result suggestive of a historical infection[1] and a negative second NAA[2], taken at least 24 hours apart.
2. IgG or total antibodies detected via a validated laboratory serological test in the absence of recent vaccination. Consider the need to undertake supplemental or confirmatory serological testing, particularly if there is no history of a previous clinically compatible illness.
3. Has had no new symptoms consistent with COVID-19 in the previous 14 days, or the symptoms are explained by either the detection of another respiratory pathogen or past SARS-CoV-2 infection that has met release from isolation criteria, as determined by treating clinician, laboratory and PHU (see below) .
4. Has not had contact with a confirmed case of COVID-19 in the 14 days prior to the first NAA result suggestive of a historical infection[1].

Formal documentation of previous infection is not necessary; however, some PHUs and jurisdictions may require this.

For persons who meet some but not all the above criteria, including when serology is not available, an expert reference panel may undertake case-by-case review to determine whether the infection is historical. This may be pertinent when a person has respiratory symptoms but is positive for another respiratory pathogen. The epidemiological context of the traveller's country of origin and any known links to a confirmed case should be considered.

Note:

[1] NAA results suggestive of an historical infection should be undertaken in consultation with the responsible supervising pathologist or senior clinical scientist. NAA results suggestive of a historical infection may include high cycle threshold (Ct) values or equivalent findings using other platforms that do not report Ct values. High Ct values are as defined in consultation with the responsible supervising pathologist or senior clinical scientist.

[2] Ideally, specimens should be oropharyngeal and bilateral deep nasal swabs or nasopharyngeal swabs, in accordance with *PHLN guidance on laboratory testing for SARS-CoV-2*. They should also be processed via the same laboratory and platform.

Release from isolation criteria for all confirmed cases who do not meet historical infection criteria

The following information details release from isolation criteria for confirmed cases

Cases can be released from isolation if they meet the appropriate criteria in any of points 1, 2 or 3 – whichever is applicable. Significantly immunocompromised cases will also need to meet additional criterion in point 4 in order to be released from isolation.

If a COVID-19 case is infected with an emerging variant of concern with unknown viral characteristics (e.g. Omicron), some jurisdictions may implement a more conservative approach to release from isolation criteria (See Appendix B).

1. Confirmed cases who have remained asymptomatic

Irrespective of vaccination status the case can be released from isolation if:

- at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by NAA was taken; and
- no symptoms have developed during this period.

In exceptional circumstances, some jurisdictions may support earlier release if:

- the case is fully vaccinated; and
- at least 7 days have passed since the first respiratory specimen positive for SARS-CoV-2 by NAA was taken; and
- no symptoms have developed; and
- NAA is negative at day 7 from specimen collection date.

2. Confirmed cases with resolution of fever and acute respiratory symptoms

Irrespective of vaccination status the case can be released from isolation if:

- at least 10 days have passed since symptom onset; and
- there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1].

In exceptional circumstances, some jurisdictions may support earlier release if:

- the case is fully vaccinated; and
- at least 7 days have passed since symptom onset; and
- there has been resolution of fever and respiratory symptoms of the acute illness for the previous 72 hours[1]; and
- NAA is negative at day 7 from specimen collection date.

3. Confirmed cases without complete resolution of acute respiratory symptoms

The case can be released from isolation if they meet **all** of the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
- the case is not significantly immunocompromised[3]

OR

The case can also be released from isolation if they meet **all** the following criteria:

- at least 10 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and
- two consecutive respiratory specimens negative[2] for SARS-CoV-2 by NAA taken at least 24 hours apart after day 7 from symptom onset.

4. Significantly immunocompromised persons

In addition to meeting the appropriate criteria described in points 1 or 2 above, confirmed cases who are significantly immunocompromised[3] must meet a higher standard requiring additional assessment.

Regardless of vaccination status, COVID-19 cases who are immunocompromised can be released from isolation when they meet the following additional criterion:

- A negative NAA test[2] on at least two consecutive respiratory specimens collected at least 24 hours apart after day 7 from symptom onset[4].

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). PHUs should discuss this with the treating medical practitioner and the testing laboratory.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be NAA negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be NAA negative.

Testing after release from isolation

Recovered cases should be tested for SARS-CoV-2 if they develop new symptoms of COVID-19 at least 1 month[2] after release from isolation.

If at least 1 month[2] has passed after release from isolation, and a recovered case has a re-exposure that is outside their immediate household, or there is a new case in their household (and the recovered case had previously isolated away from their household), the recovered case should be managed as a contact.

In the absence of a re-exposure, recovered cases that are asymptomatic do not need to be retested within 1 month after release from isolation[2].

If a case is identified retrospectively through serology, clinical and public health judgement should be used in determining case management and whether or not a case requires isolation. If the case had a clinically compatible illness consistent with a historic infection, it may not be necessary to isolate. If isolation is required, the case can be released from isolation when the appropriate criteria (above) is met.

Release from isolation and high-risk settings

Cases returning to a high-risk setting can be released from isolation based on the clinical criteria above and do not need to meet a higher standard or undergo additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met the appropriate criteria above, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

However, there is some laboratory based evidence that a small proportion of people with a Delta variant infection may still be infectious despite fulfilling the appropriate criteria above. Some jurisdictions with low or no community transmission may require additional criteria or measures for cases who will be released back to high-risk settings.

Hospitalised patients who are being transferred to another ward or hospital should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met.

People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non COVID-19 related condition.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in

[2] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

Release from isolation and gastrointestinal symptoms

Faecal sampling is not recommended as a standard test, however, it may be done for patients with gastrointestinal symptoms. Cases who have persistently positive faecal samples test results after meeting release from isolation criteria, may need to follow further precautions or exclusions on a case-by-case basis:

- All cases with diarrhoea should not prepare/ food for others until 48 hours after symptoms have resolved.
- Cases who are employed in a role where there is an increased risk of onward transmission (e.g. health care workers, restaurant workers and food handlers), should be excluded from work until 48 hours after any symptoms of diarrhoea have resolved.
- Cases with ongoing diarrhoea or faecal incontinence who may have limited capacity to maintain standards of personal hygiene should be isolated until 48 hours after the resolution of these symptoms.

Patients do not require repeat testing until they are NAA negative in faecal samples. People who remain persistently NAA positive in faecal samples use soap and water or alcohol-based sanitiser for hand hygiene. PHUs should provide education emphasising the importance of proper hand hygiene to all cases upon release from isolation.

7. Contacts

Close contact definition

The aim of contact tracing is to interrupt transmission of SARS-CoV-2 through identification and quarantining of people in contact with infectious cases. PHUs can use the below close contact criteria to identify and prioritise people who have been exposed and potentially incubating the disease.

If a COVID-19 case is infected with an emerging variant of concern with unknown viral characteristics (e.g. Omicron), some jurisdictions may implement a more conservative approach to close contact identification (see Appendix B for an example alternative definition). In this situation, PHUs may consider upgrading contact classifications and management to a higher risk category.

Contact classification	Type of contact made during the case's infectious period
Close contact	A person who has had at least 15 minutes face to face contact with a COVID-19 case and there is reasonable risk of transmission including: • Household contacts • Social contacts with extensive interaction with the case • Contacts in settings at highest risk for extensive transmission or severe outcomes of infection (e.g. Abattoirs, hospitals, accommodation facilities for vulnerable people)
Lower risk contact	A person who has had less than 15 minutes face to face contact with a COVID-19 case and there is some risk of transmission based on: • vaccination status of both case and contact; • PPE use of both case and contact (e.g. mask type, see Health and residential care workers for health care settings) • the setting (e.g. indoors vs outdoors, size of room, adequacy of ventilation); • the specific variant of SARS-CoV-2; and • the nature of the exposure (e.g. whether shouting or singing).

It is difficult to prescribe a minimum duration of contact that results in infection, as even fleeting personal interactions can result in infection with SARS-CoV-2. The above definitions represent prioritisation based on risk of infection in a setting where some COVID-19 transmission is acceptable in the community.

Some jurisdictions have developed risk matrices for classification of close contacts in certain settings (e.g. for schools, workplaces). The rationale for risk assessment guidance is to balance COVID-19 transmission risk with the risk of furloughing staff to the extent that the business becomes non-operational. Such guidance will take account of specific risk mitigations within the operation of the business.

For additional considerations for identification of contacts in jurisdictions with low or no community transmission see Appendix B.

Note that:

- For contact tracing, the infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).
- If the case is asymptomatic, the infectious period is the period extending from 48 hours before the initial positive test until the case is classified as no longer infections (refer to Release from isolation).
- For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, see Health and residential care workers.

Management of contacts

PHUs should assess all persons identified as having had contact with a confirmed case to determine if they should be managed as a close contact. Where possible, PHUs should collect demographic and epidemiological data. Jurisdictions are encouraged to automate contact management processes where feasible.

If a COVID-19 case is infected with an emerging variant of concern with unknown viral characteristics (e.g. Omicron), some jurisdictions may manage contacts more conservatively, e.g. require all close contacts to follow quarantine or testing requirements outlined for unvaccinated close contacts. PHUs may also consider additional quarantine and testing requirements for lower risk contacts (Appendix B).

In jurisdictions with extensive community transmission, PHUs may shift active contact tracing efforts toward high-risk settings only, such as: aged care, disability care, hospitals, correctional services, homelessness services and remote communities. This will enable skilled public health staff to focus on high priority close contacts to be quarantined and tested.

Additionally, jurisdictions with community transmission may devolve contact management practices to other methods such as automated identification and management of lower risk contacts. Jurisdictions may also provide public information to support self-managed contact tracing, testing and quarantine. Some PHUs may request cases to follow up their own contacts and ask them to follow relevant public health advice.

Quarantine and restriction of close contacts

Where feasible, PHUs should ensure careful selection of a contact's site of quarantine to prevent transmission to others. Some residences may not be feasible if the person cannot quarantine away from other house members (e.g. small apartments, dwellings with multiple generations of family members).

The precautionary advice in this guideline uses an incubation period upper range of 14 days to guide public health measures such as quarantine. However jurisdictions may wish to consider alternate options for quarantine, including a possible mixed model approach (shorter quarantine followed by a time period of less stringent restrictions) based on local risk assessment.

Close contacts who have recovered from COVID-19 do not need to quarantine if:

- they remain asymptomatic;
- they are not immunocompromised; and
- re-exposure is less than 1 month since symptom onset (see Testing after release from isolation).

In jurisdictions with community transmission, where public health workforce capacity is exceeded, PHUs should focus close contact management efforts on higher risk close contacts. Some jurisdictions may choose to have less active management of lower risk close contacts.

PHUs should advise close contacts to:

1. Monitor their health.
    - PHUs should provide advice on the processes for seeking medical care, including how to safely seek COVID-19 testing if symptoms develop. Refer to Medical care for quarantined individuals.
    - Resourcing permitting, PHUs may conduct active monitoring of close contacts for COVID-19 symptoms for 14 days after last possible contact with a confirmed COVID-19 case. This may include via daily SMS follow up.
2. Quarantine for a specified period following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for the specified minimum period regardless of any negative test result (see below).
3. Get tested during the quarantine period (see below table).

Quarantine and testing requirements for close contacts

Fully vaccinated close contacts	Unvaccinated/partially vaccinated close contacts or unknown vaccination status
Quarantine requirements • At a minimum, fully vaccinated close contacts should quarantine for 7 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. • Quarantine must occur for 7 days regardless of any negative test result. **Testing during quarantine** • Testing of close contacts should occur: ○ If COVID-19 symptoms develop ○ On entry to quarantine ○ Before exit from quarantine - A test late in the quarantine period (e.g. after day 5-post exposure), should be conducted. - In some circumstances, PHUs may also consider the need for	**Quarantine requirements** • At a minimum, unvaccinated or partially vaccinated close contacts should quarantine for 14 days following the last possible contact with a confirmed COVID-19 case, during the case's infectious period. • Quarantine must occur for 14 days regardless of any negative test result. **Testing during quarantine** • Testing of close contacts should occur: ○ If COVID-19 symptoms develop ○ On entry to quarantine ○ Before exit from quarantine - A test late in the quarantine period (e.g. day 12-13), should be conducted.

extension of quarantine if a close contact refuses to undergo exit testing. • If laboratory testing systems are under strain, PHUs may consider not testing close contacts (particularly household contacts) who develop symptoms, and instead considering them probable cases if they develop symptoms. **Other measures** • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house. • Jurisdictions with low or no community transmission may implement more conservative approaches.	- In some circumstances, PHUs may also consider the need for extension of quarantine if a close contact refuses to undergo exit testing. ○ Mid-quarantine (where appropriate) - If there is reason to doubt compliance with quarantine or high risk of the close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Enhanced management of household contacts

In households with one or more confirmed cases of COVID-19, PHUs may implement several enhanced contact management strategies. These strategies are useful for people living together in close quarters where quarantine is not possible (e.g. single parent families with young children) or challenging (e.g. extended families that share multiple living spaces, people who share a small apartment). Given the greater potential for multiple generations of transmission in these settings, enhanced contact management strategies may reduce the number of secondary cases as well as the overall period of quarantine for household members.

Potential strategies include those used in outbreaks in closed settings, for example:

- Providing separate accommodation to cases on diagnosis, or to asymptomatic household members
- Providing separate accommodation for close contacts who are unable to quarantine from the rest of the household
- NAA testing of household contacts in mid-quarantine, in addition to the entry and exit testing, to enable early identification and isolation of cases
- Quarantine of an entire household
- Serological testing of household contacts to identify household members who have had earlier undiagnosed infection and therefore not at risk of becoming infectious with COVID-19 (noting that interpretation of serology requires expert review and interpretation in light of clinical and epidemiological risk).

In some larger households, PHUs may wish to use similar principles in managing a case in an outbreak setting (see Appendix C: Outbreak investigation and management).

Health and residential care workers

For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by exposure risk, see *Work Permissions and Restrictions Framework for Workers in Health Care Settings*.

In the context of an outbreak and community transmission, this framework supports safe decision making when determining whether to place work permissions/restrictions, independent of quarantine, on a worker after a COVID-19 exposure in a health care setting.

Aircraft passengers and crew

Passengers

PHUs may classify aircraft passengers seated in the same row or two rows in front or behind a confirmed COVID-19 case during the case's infectious period as close contacts. PHUs can use similar criteria for people who have had close contact on bus or train trips.

Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport.

For domestic flights, jurisdictions may consider alternative ways of managing passengers who may be contacts of COVID-19 cases, such as posting flight details on a website and issuing public health alerts.

Risk assessment and management of aircrew

For aircraft crew exposed to a confirmed case, the relevant PHU should conduct a case-by-case risk assessment, in collaboration with airlines, to identify aircrew close contacts. Refer to Appendix D and Appendix E for further information.

Quarantine and essential workers

Close contacts who are essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, PHUs should conduct an individual risk assessment to identify if some essential workers can be permitted to maintain normal work patterns while in quarantine.

This should only occur in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If permitted to maintain normal work patterns, the essential worker must practise vigilant physical distancing and hand and respiratory hygiene, and wear a mask whilst at work. They should adhere to normal quarantine restrictions when outside of essential work activities.

Medical care for quarantined individuals

PHUs should advise close contacts that if they require medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department and advise them of their close contact status before presenting. Close contacts with severe symptoms should call 000 and clearly communicate to the emergency services operator that they are a close contact. Close contacts should wear a mask before presenting to any health care setting.

Management of symptomatic contacts

If fever or respiratory symptoms consistent with COVID-19 develop within the first 14 days following the last contact with a confirmed case, the individual should be immediately isolated with urgent testing for COVID-19 undertaken in an environment that minimises the exposure of others.

Ill contacts who are being evaluated for COVID-19 can be appropriately isolated and managed at home or in other community settings identified by the PHU, unless their condition is severe enough to require hospitalisation.

Symptomatic close contacts who test negative for SARS-CoV-2 by NAA should be re-tested, given the higher pre-test probability for COVID-19. Re-testing should occur as soon as possible after a negative result is received, and if still negative, another test may be conducted on day 14 of the quarantine period. They will still need to be monitored for 14 days after their last contact with a confirmed COVID-19 case.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

8. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

9. Special situations

Use of COVID-19 vaccination in outbreak situations

Targeted vaccination of defined populations who may be at risk of exposure is an important activity complementing existing public health interventions. Targeted vaccination may increase the proportion of people who have received one dose, are fully vaccinated, or have received a booster dose of a COVID-19 vaccination (where eligible).

In an outbreak, PHUs can use COVID-19 vaccination to:

1. Reduce the number and severity of COVID-19 cases in an outbreak, where there is likely to be an ongoing risk of exposure.
2. Opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

Key considerations about using COVID-19 vaccines during outbreaks include: the location, target population, context of the outbreak, local epidemiology of COVID-19, and timing of potential exposure.

Vaccination as an outbreak response tool is of greatest use in geographic areas or populations with low vaccination coverage. However, public communications should emphasise the importance of people getting vaccinated even in areas of high coverage.

PHUs can also use COVID-19 vaccination in closed settings where there is an ongoing risk of exposure due to multiple chains of transmission. Example settings include residential aged care facilities, correctional facilities, remote industrial sites (e.g. mining camps) or educational institutions.

In these contexts, vaccination may provide both direct protection against severe illness and death, and indirect protection by limiting outbreak size and duration.

Where possible, PHUs should evaluate the effectiveness of vaccination campaigns in limiting the impacts of COVID-19 at the conclusion of the outbreak.

International travellers

Quarantine requirements for international travellers entering Australia are different for fully vaccinated versus partially or unvaccinated arrivals. It is important to note that the definition of fully vaccinated for international travel purposes differs to the definition included in this guidance. For more information about vaccination and international travel, pre-flight testing and travel requirements, see *International travel and COVID-19* and *Coronavirus (COVID-19) FAQs – international travellers to Australia*.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

If a confirmed case has attended the workplace while infectious, PHUs can assist workplaces to conduct a risk assessment of potential workplace transmission. This includes assisting workplaces in the identification of workers who have had close contact with the infected worker. PHUs should provide workplaces with a general framework to help with internal risk assessment. In settings with high vaccine coverages, PHUs may take a more considered approach to risk assessment to ensure that economic and social costs are minimised. For more information, see *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

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11. Appendices

Appendix A: Public health unit checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case; and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange NAA and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to High-risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know.

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection and follow the cross-border protocol for notifying cases to other jurisdictions as appropriate.

Consider need for media release and designate a media spokesperson.

Appendix B: Additional considerations for jurisdictions with low or no community transmission

This appendix provides additional testing and contact management considerations for PHUs in jurisdictions with low or no community transmission. PHUs in jurisdictions with low or no community transmission may decide to trace and manage casual and secondary close contacts.

As jurisdictions move towards a context of community transmission, and public health capacity is exceeded, PHUs may discontinue using this additional guidance.

Additional testing considerations

In jurisdictions with low or no community transmission, individuals meeting the suspect case definition may be tested for SARS-CoV-2.

Jurisdictions with low or no community transmission may also conduct additional testing for screening purposes, for example in COVID-19 quarantine and isolation facilities and workers in health care settings.

Applying a suspect case definition

In jurisdictions with low or no community transmission, PHUs can use the suspect case definition to identify those who may have an increased likelihood of current SARS-CoV-2 and where having such a definition may continue to have public health utility.

Suspect cases may require specific infection prevention and control measures and public health management. Suspect cases do not need to be notified to the NNDSS.

A suspect case is a person who meets the below **clinical** and **epidemiological** criteria.

Clinical evidence (in the past 14 days):

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory infection (e.g. cough, shortness of breath, sore throat)[1]; or
- Loss of smell or loss of taste.

Epidemiological evidence (in the past 14 days):

- Close contact with a confirmed case
- International travel
- Workers supporting designated COVID-19 quarantine and isolation services
- International air, maritime and border staff
- Health care workers with potential COVID-19 patient contact
- People who have been in areas with COVID-19 community transmission

Notes:

[1] Other reported symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite. Clinical and public health judgement should be used to determine if individuals with sudden and unexplained onset of one or more of these other symptoms should be considered suspect cases.

Management of suspect cases

PHUs may consider undertaking case interviews, exposure site identification and close contact identification for suspect cases. PHUs may undertake a risk assessment for suspect cases who initially test negative for SARS-CoV-2. If there is no alternative diagnosis and there remains high suspicion that the person has COVID-19, PHUs may support continued isolation and use of relevant infection prevention and control precautions, whilst awaiting further testing and re-assessment (refer to Testing section and *PHLN guidance on laboratory testing for SARS-CoV-2*.

Suspect cases can otherwise discontinue isolation upon receipt of a negative test result and resolution of symptoms. See Post-testing instructions and isolation requirements for suspect cases and enhanced testing.

Testing in COVID-19 quarantine and isolation facilities

International travellers

Jurisdictions with low or no community transmission may conduct routine testing of international travellers who are in hotel quarantine. Testing may occur on day 0–2 and then on day 12-14, preferably as late as possible, of hotel quarantine. Some jurisdictions may undertake mid-quarantine testing for earlier identification of cases and require confirmation of exit testing prior to release from quarantine. Some jurisdictions may also require further testing after the traveller has left managed quarantine.

Exact arrangements for post-quarantine testing depend on state and territory protocols.

COVID-19 quarantine and isolation facility workers

Some jurisdictions may require COVID-19 quarantine and isolation facility workers to undergo daily COVID-19 testing for screening purposes. Jurisdictions may determine appropriate methods for routine testing, including alternative methods of sampling, such as testing saliva samples.

Routine testing should complement but not replace existing infection prevention and control activities as well as occupational health and safety requirements intended to protect workers; to ensure the safety of quarantine facilities and prevent spread of infection from quarantine and isolation settings to the wider community.

Jurisdictions may implement additional requirements for quarantine workers. See Australian Health Protection Principal Committee (AHPPC) statement on National Principles for Managed Quarantine.

Testing in health care settings

Jurisdictions with low or no community transmission may request routine testing of staff in health care settings, in addition to other control strategies. Periodic and comprehensive screening of staff in health care settings can assist in earlier identification of infection in health care environments.

Routine testing of staff in health care settings is recommended on a voluntary basis. However, jurisdictions may determine the triggers for when routine testing is implemented and implement mandatory testing in certain high-risk situations. Jurisdictions may determine

the appropriate frequency and method for routine testing, depending on the specific circumstances.

Considered routine testing for health care setting staff who:

- directly care for COVID-19 patients
- work at COVID-19 testing sites
- provide occasional or intermittent care to COVID-19 patients (e.g. medical consulting units, pharmacists, allied health)
- work within the patient/client/resident zone for COVID-19 patients (e.g. ward clerks, cleaners, pharmacy deliveries, food delivery)
- transport a COVID-19 patient to a health care setting work in high risk areas of the hospital that don't have confirmed cases (e.g. staff in emergency departments)
- work in community health centres (e.g. GP led respiratory or fever clinics)

Provided they do not have COVID-19 symptoms and are not a close contact, staff in health care settings who undergo routine testing are not required to isolate whilst awaiting a negative result and may continue to work.

If staff are away from work for 7 days or more, they may be requested to undertake a COVID-19 test with oropharyngeal and deep nasal or nasopharyngeal swabs. E.g. Every 7 days while away until 14 days have passed since they were last at work.

Jurisdictions may also need to consider testing requirements for staff:

- working across wards or campuses
- working between hospitals/jobs
- who are inpatients or outpatients
- visiting high-risk settings such as hospitals or aged care facilities

The need for routine testing in these circumstances should be assessed case-by-case, giving consideration to the associated level of risk.

Post-testing instructions and isolation requirements for suspect cases

The following post-testing instructions apply for suspect cases and individuals who have undergone enhanced testing in jurisdictions with low or no community transmission.

1. Symptomatic people who are not contacts of a confirmed case should stay at home until they receive a negative test AND their symptoms resolve, regardless of vaccination status.
2. Symptomatic people who have tested for SARS-CoV-2 and are contacts of a confirmed case should stay at home or remain in quarantine for the period set by the PHU, regardless of negative test result.

See Additional contact management considerations for guidance on quarantine and testing of contacts in jurisdictions with low or no community transmission.

If the test results come back positive – see Case management.

Additional release from isolation criteria considerations

Jurisdictions with low or no community transmission may choose to apply more conservative release from isolation criteria for COVID-19 cases that are infected with an emerging variant of concern with unknown viral characteristics (e.g. Omicron).

The following information details alternative release from isolation criteria for confirmed cases. See Release from isolation for further information.

Confirmed cases who have remained asymptomatic

The case can be released from isolation if:

- at least 14 days have passed since the first respiratory specimen positive for SARS-CoV-2 by NAA was taken; and
- no symptoms have developed during this period.

In exceptional circumstances, some jurisdictions may support earlier release if:

- at least 10 days have passed since the first respiratory specimen positive for SARS-CoV-2 by NAA was taken; and
- no symptoms have developed; and
- NAA is negative at day 10 from specimen collection date.

Confirmed cases with resolution of fever and acute respiratory symptoms

The case can be released from isolation if:

- at least 14 days have passed since symptom onset; and
- there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1].

In exceptional circumstances, some jurisdictions may support earlier release if:

- at least 10 days have passed since symptom onset; and
- there has been resolution of fever and substantial improvement of respiratory symptoms of the acute illness for the previous 72 hours[1]; and
- NAA is negative at day 10 from symptom onset.

Confirmed cases without complete resolution of acute respiratory symptoms

The case can be released from isolation if they meet **all** of the following criteria:

- at least 20 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness[1]; and
- the case is not significantly immunocompromised[3]

OR

The case can also be released from isolation if they meet **all** the following criteria:

- at least 14 days have passed since the onset of symptoms;
- there has been resolution of fever for the previous 72 hours;
- there has been substantial improvement in respiratory symptoms of the acute illness [1]; and

- two consecutive respiratory specimens negative[2] for SARS-CoV-2 by NAA taken at least 24 hours apart after day 10 from symptom onset.

Notes:

[1] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner should make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[2] In patients in which swabs are required to meet release from isolation criteria but where swabs remain positive, additional factors may be considered to determine the need of ongoing isolation, including the clinical scenario and laboratory details (e.g. Ct values, viral culture and serology results). PHUs should discuss this with the treating medical practitioner and the testing laboratory.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; or other conditions specifically noted by the treating medical practitioner.

[4] If the patient has a productive cough due to a pre-existing respiratory illness or other ongoing lower respiratory tract disease, then the sputum or other lower respiratory tract specimens must be NAA negative for SARS-CoV-2. Otherwise upper respiratory tract specimens (deep nasal and oropharyngeal swabs) must be NAA negative.

Additional contact management considerations

Identification of potential source contacts

Potential source contacts (or 'upstream contacts') are individuals who had contact with the first reported case during the time in which the case was likely to have acquired infection. In low or no community transmission settings, where a confirmed case has no identified source of infection, potential source contact tracing of the 'first reported case' (or in an outbreak, index case) may be undertaken. This is particularly important when the public health aim is to identify all potential unrecognised chains of transmission and the source of introduction of disease in a setting where there is potential for rapid transmission (e.g. aged care facilities, correctional facilities, and closed community settings). In such settings, potential source contact tracing may be done for the index case.

For most cases, infection is likely to have been acquired 5-6 days prior to the first reported case becoming symptomatic (i.e. the median incubation period of the disease) but may be from anyone who has had contact between 14 days and 24 hours before the first reported case became symptomatic (i.e. the longest and shortest possible incubation periods). These individuals may be unidentified cases and the transmission source for the first reported case.

PHUs may consider following up any person who in that period who had:

- face-to-face contact of any duration or shared a closed space (for at least 1 hour) with a confirmed case during their infectious period (from 48 hours before onset of symptoms until the case is no longer infectious)
- exposure to a setting or exposure site where there is a high prevalence of infection e.g. a country where there is community transmission of COVID-19, or unprotected exposure in a quarantine hotel for international travellers
- been in a venue where transmission has been demonstrated to have occurred during the time frame in which the transmission would be expected to have occurred.

All potential source contacts may be screened for possible symptoms and be tested for SARS-CoV-2 infection with a NAA test; with prioritisation of those at highest risk. If a validated serological assay is available, serological testing may be considered for potential source contacts who are unvaccinated and asymptomatic (noting the limitations of antibody testing and potential lack of availability). In settings where there is potential for rapid transmission, it is likely that some contacts will be identified as both close contacts and potential source contacts and contact status may not be able to be determined.

For potential source contacts who test positive via NAA or (for unvaccinated individuals) a validated serological assay, clinical and public health judgement should be used to determine if they are infectious; if infectious, they should be managed as any other confirmed case. They should also be assessed to determine if they are likely to be the primary case who infected the index case, a secondary case infected by the first reported case, or represent a separate transmission chain. Wherever a new case is identified, rapid contact tracing of these cases must also occur.

Alternative primary close contact definition

In jurisdictions with low or no community transmission, PHUs may use the following expanded definition of a primary close contact, as a precautionary measure (resourcing permitting).

A primary close contact is defined as a person who has:

- had face-to-face contact with a confirmed case during their infectious period; or
- shared a closed space with a confirmed case during their infectious period, where there is reasonable risk of transmission based on a risk assessment performed by the PHU, taking into account:
    - transmission having been proven to have readily occurred in this (or a similar) setting;
    - the specific variant of SARS-CoV-2;
    - the adequacy of air exchange in an indoor environment; or
    - the nature of the exposure (e.g. type of contact, mask use, whether shouting or singing, size of venue etc.).

Note that:

- The infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation). More conservative periods (e.g. 72 hours prior to illness onset) may be considered, at the discretion of the PHU.

Alternative management of primary close contacts

PHUs in jurisdictions with low or no community transmission may request primary close contacts to do the following actions, regardless of vaccination status:

- Quarantine for 14 days following the last possible contact with a confirmed COVID 19 case, during the case's infectious period. Quarantine must occur for 14 days regardless of any negative test result.
- Monitor their health. PHUs may conduct active daily monitoring of primary close contacts for COVID-19 symptoms for 14 days after the last possible contact with a confirmed COVID-19 case. This includes SMS contact.
- Get tested during the quarantine period (see below).

Advise primary close contacts on the processes for seeking medical care, including how to safely seek COVID-19 testing if they develop symptoms. Refer to Medical care for quarantined individuals.

In jurisdictions with low or no community transmission, testing of primary close contacts may occur:

1. If COVID-19 symptoms develop
2. On entry to quarantine
    - A positive test result would make the primary close contact a case and support an earlier decision to move the person to an alternative place for isolation and bring forward contact tracing for that person.
3. Before exit from quarantine
    - A positive test result late in the quarantine period (e.g. day 10–13), prevents the release of potentially infectious people into the community.
    - In some circumstances, PHUs may also consider the need for extension of quarantine if a primary close contact refuses to undergo exit testing.
4. Mid-quarantine (where appropriate)
    - If there is reason to doubt compliance with quarantine or high risk of the primary close contact becoming a case, a test mid-quarantine may be added to make decisions regarding suitability of accommodation and/or identify infection earlier.

Identification of casual contacts

In jurisdictions with low or no community transmission, and at the discretion of the PHU, there is likely to be some utility in following up casual contacts in addition to close contact as a precautionary measure (resourcing permitting).

A casual contact is defined as a person who has:

- been in the same setting with a confirmed case in their infectious period, but does not meet the definition of a close contact.

In jurisdictions with low or no community transmission, and at the discretion of the PHU, some casual contacts may be reclassified as primary close contacts. This may be relevant in super spreading events, where there is evidence of transmission occurring to individuals who do not meet the close contact definition.

The following factors may be considered prior to reclassifying casual contacts as primary close contacts:

- Epidemiological context, including level of community transmission.
- The specific variant of SARS-CoV-2.
- The potential for large scale amplification in the given setting or venue
- Jurisdictional capacity and resourcing requirements, including opportunity costs of managing them as close contacts
- Feasibility and resulting impacts of public health measures on essential services (e.g. provision of health care services)
- Vulnerability of the contacts.

Depending on the above factors, PHUs may implement a range of options for management of casual contacts in different settings.

Management of casual contacts

Quarantine and testing requirements for casual contacts

Fully vaccinated casual contacts	Unvaccinated or partially vaccinated casual contacts
1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events) • At a minimum, fully vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required.	**1. Exposure settings with very low risk of casual contacts acquiring infection (e.g. large retail settings, large outdoor events)** • At a minimum, unvaccinated or partially vaccinated casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. • No quarantine is required.
2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools) • Casual contacts should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.	**2. Exposure settings with moderate risk of casual contacts acquiring infection (e.g. restaurants, childcare centres, schools)** • Unvaccinated or partially vaccinated casual contacts may be requested to enter into quarantine, depending on the local epidemiology. If quarantine is indicated, a shorter term quarantine until around 5 days after exposure is appropriate. • They should monitor for symptoms out to 14 days post exposure and test for SARS-CoV-2 if symptoms develop. They may also be requested to test on day 4-6 after exposure.

	• If quarantined, the unvaccinated casual contact may exit quarantine once a negative day 4-6 NAA result is returned. • Jurisdictions may also apply other restrictions. E.g. restrict entry into high-risk settings for 14 days or request mask wearing for 14 days when out of the house.

Note: For guidance on management of casual contacts who are workers in healthcare settings, see Health and residential care workers.

Identification of secondary close contacts

In jurisdictions with low or no community transmission, and at the discretion of the PHU, there may be some utility in following up secondary close contacts as a precautionary measure (resourcing permitting).

A secondary close contact (also known as a close contact of a close contact) is defined as a person who has:

- had face-to-face contact or shared a closed space in any setting with a primary close contact of a COVID-19 case, from 24 hours after the primary contact's exposure to the case.

Identification of secondary close contacts is an intensive exercise aimed at a second ring of containment. It may or may not be implemented depending on the circumstances of the epidemic at the time.

Management of secondary close contacts

Some jurisdictional communicable disease authorities or PHUs may identify secondary close contacts (also known as close contacts of close contacts) and require them to quarantine for a duration of time since the exposure of a primary close contact to the confirmed case.

PHUs may consider quarantine of secondary contacts if:

- The primary close contact has a higher probability of becoming a case (e.g. lives with the case, exposed at a high-risk setting where transmission has already occurred);
- The secondary close contact is unable to remain isolated from the primary close contact (e.g. one is a carer for the other or lives in the same household);
- There will be a delay in confirming the initial case or commencing contact tracing;
- Secondary transmission has already occurred from a primary close contact to a secondary close contact;
- There are communication challenges with close contacts; or
- The consequences of the secondary case being positive is deemed very high risk (e.g. returning to a remote community).

Secondary close contacts may be quarantined until the PHU has confirmed that the primary close contact was not infectious at the time of last contact with the secondary close contact.

Household secondary close contacts

PHUs may require household secondary close contacts to quarantine until the primary close contact is cleared from quarantine.

Non-household secondary close contacts

PHUs may require secondary close contacts who are in a different household to the primary close contact to remain in quarantine until 14 days from the last exposure of the primary close contact to the confirmed case.

Alternatively, PHUs may require these secondary close contacts to remain in quarantine until there is confirmation that the primary close contact was not infectious at the last time of contact with the secondary close contact (e.g. if the primary close contact tests negative).

Appendix C: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHUs should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHUs are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHUs should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHUs should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be close contacts. These include, staff, residents (if relevant) and visitors.

PHUs may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHUs should ensure all close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHUs may also require secondary close contacts or casual contacts to quarantine.

I. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

I. Assess and record vaccination status

During outbreak investigations, it is important for PHUs to assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities*. While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.

Detailed information on environmental cleaning and disinfection in health and residential care settings is in the *COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet*. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a) With each round of testing, those who are NAA positive can be removed to positive cohort isolation wherever possible.
b) In subsequent rounds, only those who are NAA negative (i.e. those who may be susceptible) should be tested.
c) Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort on Retest Day/s**
Recommended testing and actions	**Who to test** □ Test all members of the setting via NAA. **Actions** □ Isolate positive persons (may designate an area to cohort positive cases). □ Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	**Who to test** □ Re-test NAA negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** □ Isolate positive persons □ Quarantine cohort of NAA negative residents and screen for symptoms. □ Where possible, people who initially test negative should be quarantined separately.	Recommended quarantine period (see quarantine and restriction of close contacts) starts from date that the quarantine cohort are NAA negative	If any of the quarantined cohort are positive: 1. Recommence recommended quarantine period (see quarantine and restriction of close contacts) 2. Consider retesting every 72 hours until no new NAA positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring NAA positive individuals to a suitable hospital or hospital-equivalent setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for NAA positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHUs should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix D: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew close contacts. For more information on contact tracing of aircraft passengers see Close Contacts- Aircraft passengers and crew.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a close contact.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHUs should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as close contacts.

Additional considerations for conducting a risk assessment should include:

1. **Variants of concern**
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

2. **Proximity of crew to confirmed cases**
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. **Duration of exposure to confirmed cases**
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

4. **Size of the compartment in which the crew and confirmed case interacted**
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered close contacts.

5. **The number of confirmed cases of COVID-19 on board**
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. **Potential breaches of PPE**
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

Aircrew and passengers who are close contacts

If an airline becomes aware of a crew member or passenger who was a close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix E: Guidance on the management of aircrew.

Appendix E: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Aircrew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 NAA test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the NAA test has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive NAA test for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix F: Full revision history of the COVID-19 SoNG

Revision history

Version	Date	Revised by	Changes
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management

Version	Date	Revised by	Changes
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and

Version	Date	Revised by	Changes
			management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.

Version	Date	Revised by	Changes
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.

Version	Date	Revised by	Changes
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.

Version	Date	Revised by	Changes
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 6.4

14 January 2022

Summary of revision history

For full revision history, refer to Appendix E

Version	Date	Revised by	Changes
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the *WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020*.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the *Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses*.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for COVID-19. Jurisdictions may adapt this guidance based on local epidemiological context.

Guidance within this document reflects Australia's progress through the *National Plan to transition Australia's National COVID-19 Response* and the evolving COVID-19 situation in Australia.

Updates have been made in response to the National Cabinet's decision to *reset TTIQ measures in the context of high case numbers and the Omicron variant*, including the *usage of rapid antigen tests (RATs)*, as well as the *AHPPC statement on TTIQ in high levels of COVID-19 community transmission in the context of high levels of COVID-19 transmission*.

Additionally, this document contains revised case and contact management guidance as detailed in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

CDNA has revised the guidance in this document for pragmatic reasons in response to a context of high case prevalence, altered policy settings and increased risk tolerance, and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

For detailed guidance on infection prevention and control, refer to *Infection Control Expert Group (ICEG) endorsed infection prevention and control guidance*.

Public health priority

Urgent – initiate public health responses as soon as possible. Public health responses may be automated and prioritised to assist with maintaining public health workforce capacity.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria, regardless of vaccination status.

Hospitalised confirmed cases should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of confirmed COVID-19 patients, including personal protective equipment (PPE), *see ICEG-endorsed infection control guidance*.

Historical cases do not need to isolate and public health units (PHUs) do not need to follow up their contacts.

Contact management

PHUs should manage close contacts according to management of contacts guidance.

2. Key definitions

Low or no community transmission

Low or no community transmission, in this guidance refers to infrequent or no COVID-19 cases acquired within a PHU's geographic area of responsibility.

Community transmission

Community transmission, in this guidance refers to when there are multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction.

Fully vaccinated person

Fully vaccinated refers to a person who is ≥14 days following receipt of the final dose of a primary course of COVID-19 vaccine approved or recognised by the Therapeutic Goods Administration (TGA)[1].

Partially vaccinated person

Partially vaccinated refers to a person who has received at least one dose of a COVID-19 vaccine registered by the TGA but does not meet the definition of a fully vaccinated person.

Reinfection

A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed COVID-19 that is determined to be a separate episode to the first based on epidemiological and/or laboratory findings. SARS-CoV-2 RNA detection must be greater than 4 weeks after the first laboratory confirmed infection to be considered reinfection. Wherever feasible, whole genome sequencing should be undertaken for suspected reinfections.

Breakthrough infection

A confirmed episode of SARS-CoV-2 infection in a fully vaccinated person >14 days following their final dose of a primary course of COVID-19 vaccine.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

[1] There may be differing operational definitions of fully vaccinated in jurisdictions and for purposes of international travel.

3. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. In 2021, the SARS-CoV-2 Delta variant became the predominant variant of the virus in Australia.

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Human coronaviruses cause mild illness in humans, such as the coronaviruses that cause the common cold. Rarely, animal coronaviruses can evolve and infect people and then spread between people. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. While the coronaviruses most highly related to SARS-CoV-2 are found in bats and pangolins, they are not sufficiently similar to be definitively confirmed as the reservoir. Further investigation is required to confirm the origin of SARS-CoV-2 (1).

Mode of transmission

SARS-CoV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (2). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (2).

Aerosol transmission

There is a gradient from large droplets to smaller aerosols, which may contribute to transmission of SARS-CoV-2 in certain situations. These include during aerosol generating procedures in clinical settings, in the context of certain behaviours, such as singing and shouting (3) and in certain environmental conditions. These behaviours and conditions can increase the force and range of spread of both large and small particles. Where an indoor environment has a low air exchange rate (i.e. less movement of outside air replacing the air indoors), small particles that are normally rapidly dispersed may remain suspended or be recirculated for longer periods. The particles may be moved around by natural airflow, fans or air conditioners. In these situations, airflow may play a role in transmission.

Indirect transmission

Respiratory droplets and secretions expelled by an infectious person can contaminate surfaces and objects (2). Indirect transmission via contact with contaminated surfaces and objects may be possible but does not present the same degree of risk as direct close contact with an infected person. Live SARS-CoV-2 virus can survive on surfaces for several hours to a few days, depending on the surface type and environmental conditions (4, 5). However, SARS-CoV-2 can be rapidly inactivated by alcohol, household bleach, and other chemicals (6).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of early SARS-CoV-2 variants ranged from 2–4 (7). R_0 for confined settings were potentially at the higher end of this range. The Delta variant of SARS-Cov-2 is more transmissible than previously identified variants with infectiousness nearly twice that of the historical variant (8).

Estimates of the effective reproductive number (R_{eff}) vary between settings and at different time points. R_{eff} is dependent on a range of factors. These include public health interventions such as isolation, quarantine, physical distancing, and mask wearing to limit exposure between people (9, 10).

SARS-CoV-2 variants of concern or interest

As the pandemic progresses SARS-CoV-2 variants continue to emerge. Some variants are classified as 'variants of concern' (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (11, 12).

As VOC are identified, studies are required to understand the impact of mutations on viral characteristics such as transmissibility, disease severity, vaccine efficacy, immunity after previous infection, incubation period, and infectious period. These factors have implications for public health measures necessary to protect the community and the health system. There may be a delay between the identification of cases in Australia who are infected with a new VOC, and the availability of data and evidence to guide appropriate public health interventions. Where there are emerging VOC with uncertain viral characteristics, it is prudent for jurisdictions to consider a more conservative approach to case and contact management, such as increased testing, isolation and quarantine requirements until more is known about the VOC and its epidemiological and clinical implications. More conservative public health and social measures may also be considered during this time. Depending on the characteristics of the virus, these measures may remain in place, even once the epidemiological and clinical implications are known.

Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted 'variants under investigation' or 'variants of interest'. For more information see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

The Communicable Diseases Genomics Network (CDGN) actively monitors variants and their reported mutations to understand how they influence the behaviour of the virus.

Jurisdictions should review, reinforce and continue to monitor the full range of existing infection prevention and control measures in response to SARS-COV-2 variants. For more information see *ICEG-endorsed infection control guidance*.

Incubation period

Prior to the emergence of the Delta variant, the median incubation period for people who became symptomatic was 5 to 6 days after coming into contact with another infected person, with a range of 1 to 14 days (13-15). Around 1% of COVID-19 cases developed symptoms more than 14 days after exposure (16). Evidence for the Delta variant incubation period is still emerging, however some studies suggest it may be shorter than other lineages (17, 18).

There is currently limited evidence to determine how the incubation period for breakthrough infection in vaccinated individuals may differ from infection in unvaccinated individuals.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (19, 20). Pre-symptomatic transmission can occur 1-3 days before symptom onset (21, 22). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (23).

High viral loads have been detected in asymptomatic, pre-symptomatic and symptomatic individuals, suggesting the potential for transmission irrespective of the presence of symptoms (20). However, faster viral clearance and subsequent shorter infectious periods have been observed for asymptomatic individuals (23). Symptomatic and pre-symptomatic individuals have a greater role in the spread of SARS-CoV-2 with a higher secondary attack rate than those who remain asymptomatic throughout their illness (24).

It has been demonstrated that the Delta variant is associated with higher viral burden and longer duration of viral shedding compared to previous variants of SARS-CoV-2 (25, 26). Currently available evidence suggests that initial viral load is similar between vaccinated and unvaccinated individuals, however some studies have found that vaccinated people have a more rapid decline in viral load than unvaccinated people (27-29).

For the purposes of routine contact tracing, cases are considered infectious from 48 hours prior to symptom onset. More conservative periods (e.g. 72 hours prior to illness onset) may be considered in high risk settings. This should be at the discretion of the PHU. Confirmed cases pose a risk of onward transmission and require isolation until criteria listed in the Release from isolation section have been met.

Clinical presentation and outcome

COVID-19 presents as a mild illness in approximately 80% of cases. Evidence suggests the most common symptoms are fever, cough, dyspnoea, malaise, fatigue, loss of taste and/or smell, and sputum/respiratory secretions (30-32). Other symptoms include headache, sore throat, shortness of breath, myalgia, rhinorrhoea, chills, and vomiting. Atypical symptoms may include chest pain, diarrhoea, and conjunctivitis (30-33). Loss of smell and/or taste are more common presenting symptoms than initially thought, seen in approximately 50% and 40% of cases, respectively (34).

The majority of cases recover from infection without clinical intervention, however, approximately 20% of identified cases globally to date have resulted in moderate to severe disease requiring hospitalisation. International cohort studies have suggested unvaccinated or partially vaccinated people infected with the Delta variant are more likely to be hospitalised than patients infected with the Alpha variant (35, 36)

Some individuals remain asymptomatic throughout infection. Estimates of the proportion of cases which remain asymptomatic throughout their infection range from 15 to 48% (19, 20, 37-40). It is unclear at this stage whether the higher viral burden associated with the Delta variant has changed the proportion of asymptomatic infections.

Fully vaccinated people can still become infected though infection is less likely than in someone who is unvaccinated. Disease associated with breakthrough infection is less severe, however, the risk of onward transmission appears to be similar to that for

unvaccinated individuals (41); however the period of infectiousness appears to be shorter in vaccinated cases. Severe disease can still occur in a small proportion of vaccinated people particularly the elderly and those with certain co-morbidities (42, 43).

COVID-19 in children

Acute infection with SARS-CoV-2 is generally associated with mild disease in children, and compared to adults, children have almost 25 times lower risk of severe disease (44, 45). However, however the period of infectiousness appears to be shorter in vaccinated cases. children may be hospitalised for social, rather than clinical, reasons, for example if both parents are too unwell to care for them. A rare but severe complication of COVID-19 seen in children and adolescents is Paediatric Inflammatory Multisystem Syndrome Temporally associated with SARS-CoV-2 (PIMS-TS). PIMS-TS has features resembling Kawasaki disease (KD) and toxic shock syndrome and typically occurs approximately 2 to 4 weeks after the onset of COVID-19 (46).

Longer term outcomes of COVID-19

Emerging evidence suggests up to 80% of patients with COVID-19 experience ongoing symptoms beyond two weeks following onset of acute infection (47). A large systematic review of the body of evidence collected on the post-acute sequelae of COVID found the median proportion of COVID-19 survivors experiencing at least one sequelae was 54% at 1 month (short-term), 55% at 2 to 5 months (intermediate-term), and 54% at 6 or more months (long-term.) (48, 49). In the UK, prevalence of self-reported post-acute sequelae of COVID-19 has been highest in people aged 35 to 69 years, females, people living in more disadvantaged areas, people working in health or social care, and people with disabilities (50).

Case fatality rate

As at 13 January 2022, the crude case fatality rate (CFR) for confirmed cases reported globally is approximately 1.8% (51). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, especially for mild cases, and the impact of health systems and patient outcomes. Mortality is influenced by individual risk factors and health care quality and access. Australia's CFR is less than 1% (based on surveillance data notified in Australia as of 13 January 2022). As of 13 January 2022, 39% (977/2522) of COVID-19 deaths in Australia have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Immune response

Evidence is still emerging about the immune response to SARS-CoV-2 infection, including duration of immunity and duration of antibody response (51).

The immune response to SARS-CoV-2 involves both humoral and cell-mediated immunity.

IgM antibodies are detectable before IgG antibodies. Levels of IgM antibodies appear to peak at weeks two to five from the onset of symptoms, and then decline (51). IgG antibody levels peak later, approximately three to seven weeks following symptom onset, and then plateau. IgG antibodies have been shown to persist for at least eight weeks and up to several months (51, 52).

Host cellular immunity also plays an important role in the immune response to SARS-CoV-2. (52). Evidence suggests enduring T cell immunity, with a greater magnitude of T cell response, in patients who recovered from severe, compared to mild, disease (52). The longevity of this T cell immunity and the degree of protection it provides remain unclear.

Further studies are required to understand the implications of SARS-CoV-2 variants of concern and the risk of re-infection (see SARS-CoV-2 variants of concern or interest).

Durability of immunity after SARS-CoV-2 infection likely differs significantly from person to person depending upon a range of factors (age, co-morbidities and pre-existing immunosuppression and previous vaccination). Studies suggest a strong immune response after previous infection, with effective natural immunity to future infectious in most individuals (53). However, vaccination continues to provide the best protection against reinfection (54-58).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19 through international or domestic travel;
- Are caring for COVID-19 cases; or
- Come in contact with people with a higher likelihood of having active infection.

These groups of people often work in certain occupational groups and include, but are not limited to:

- international border staff
- workers supporting quarantine and isolation services
- air and maritime crew
- health care and aged care workers with direct patient contact

Depending on the epidemiological context, there are other groups of workers at higher risk of infection, such as casual and mobile employees working across multiple settings. Some of these workers include cleaners, rideshare service and taxi drivers, and security personnel. There are several factors that may put them at higher risk, including:

- multiple exposure points;
- staff who may have a perceived need to continue work despite being unwell; and
- language barriers for people from culturally and linguistically diverse backgrounds.

Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions. These settings may include, but are not limited to:

- health care facilities;
- residential aged care facilities;

- residential care facilities;
- crowded or high-density housing;
- Aboriginal and Torres Strait Islander communities (particularly in rural and remote areas)
- correctional and detention facilities;
- homeless shelters and residential/crisis hostels;
- mining sites; and
- food processing, distribution and cold storage facilities, including abattoirs.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

4. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and, as much as possible, disease transmission. It is anticipated that high levels of COVID-19 vaccination coverage will facilitate the progressive winding back of public health and social measures such as travel restrictions and physical distancing.

As of December 2021, the Australian Technical Advisory Group on Immunisation (ATAGI) recommends vaccination for all individuals aged 5 years and over in a two-dose vaccine schedule (3 doses for severely immunocompromised individuals). ATAGI recommends the use of a single booster dose for anyone aged 18 and older who completed their primary COVID-19 vaccine course ≥4 months ago. This will initially include, but not be limited to, groups who were prioritised in the rollout of the vaccine program from early 2021. For more information, see *ATAGI statement on the Omicron variant and the timing of COVID-19 booster vaccination* and *ATAGI recommendations on Pfizer COVID-19 vaccine use in children aged 5 to 11 years*.

The COVID-19 vaccines registered for use in Australia have all been shown to be highly effective against severe disease, including due to the Delta variant (59). Vaccine effectiveness against hospitalisation due to Delta infection has been shown to be 95.2% and 98.4% for Vaxzevria (AstraZeneca) and Comirnaty (Pfizer), respectively, 2 to 9 weeks following the second dose (59). The effectiveness of these two vaccines against death has been shown to be 94.1% and 98.2%, respectively (59). Existing vaccine safety monitoring systems have been strengthened, with weekly COVID-19 vaccine safety reports provided by the Therapeutic Goods Administration and AusVaxSafety active surveillance system.

Other prevention activities

When combined, prevention and control activities, can help limit the spread of certain respiratory diseases, including COVID-19. These measures may include:

1. Physical distancing and gathering
    - Physical distancing can reduce the potential for transmission. Physical distancing measures may include:
        - maintaining a distance of 1.5m from people
        - density restrictions; and
        - limits on the number of people allowed to participate in an event.
2. Environmental controls, such as optimised ventilation
3. Personal hygiene
    - PHUs should encourage good hygiene practices to prevent SARS-CoV-2 infection including:
        - wearing a face mask where physical distancing cannot be maintained, particularly indoors;
        - staying home if unwell;
        - effective hand and respiratory hygiene; and
        - cleaning surfaces
4. Travel restrictions
    - Some jurisdictions will require quarantine or testing of domestic and international travellers. See *COVID-19 FAQs- international travellers to Australia.*

5. Surveillance

There are five main objectives of surveillance for COVID-19, which are to rapidly:

1. Identify, isolate and manage cases.
2. Identify, quarantine and provide relevant information to contacts.
3. Detect and manage clusters and outbreaks.
4. Characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place;
    - describing the transmission dynamics;
    - identifying groups at special risk of infection or more severe disease; and
    - monitoring for SARS-CoV-2 variants.
5. Monitor the effectiveness of the following routine prevention and control activities, in managing the COVID-19 outbreak over time:
    - vaccination;
    - test, trace, isolate and quarantine processes; and
    - public health and social measures.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit upon receipt of a notification or report of a confirmed case of COVID-19 or death in an infected person. Jurisdictions can determine reporting requirements for probable cases (e.g. requiring probable cases to self-report positive RAT results).

As much information regarding the case's age, sex, comorbidities, vaccination status, place of residence, occupation, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status, likely place of acquisition, identification of close contacts and follow-up action taken should be collected, with additional information being followed up based on risk assessment.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

PHUs should enter initial information on confirmed cases of COVID-19 onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one working day of the notification/report. Enter enhanced surveillance data shortly after case follow-up. Jurisdictions are encouraged to prioritise and automate as many of these processes as possible, including linking COVID-19 cases to clinical services.

Surveillance of variants of concern

Early identification of cases, where there is a high probability of infection with a VOC such as the Omicron variant, can inform appropriate public health responses. Ideally, these VOC are identified through whole genome sequencing. Omicron primary test results with spike gene target failure may indicate probable infection with this variant. Where possible, public health reference laboratories should confirm the infecting strain using whole genome sequencing, although this may not be possible where large numbers of cases are occurring.

Jurisdictions can refer to the *CDGN Laboratory Case Definitions for SARS-CoV-2 Variants of Concern* for more information.

6. Cases

Definitions

Reporting

Notify confirmed cases in the jurisdiction of public health management. Jurisdictions can determine reporting requirements for probable cases.

People meeting the confirmed or probable case criteria who were previously diagnosed and managed overseas or in another Australian jurisdiction in the past 4 weeks[2] do not need to be re-notified. In this situation, the person should provide documented evidence of diagnosis overseas or interstate to the PHU.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic amplification acid testing (NAAT);

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a NAAT;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[3].

Probable case

A probable case includes individuals who have laboratory suggestive evidence

Laboratory suggestive evidence:

Detection of SARS-CoV-2 by rapid antigen testing (RAT)

[2] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

[3] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

Testing

Specimen collection and testing for SARS-CoV-2

Nucleic acid amplification testing using reverse transcription polymerase chain reaction (RT-PCR) or transcription-mediated amplification (TMA) is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection. For advice on selecting a suitable sample for diagnostic RT-PCR testing for SARS-CoV-2; specimen handling in the laboratory; and different types of SARS-CoV-2 specific testing, see *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Alternative testing methods, including rapid antigen testing for SARS-CoV-2, may be used in specific contexts and settings where pre-test probability is high. See *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests*. PHUs should follow jurisdictional guidance on the use of RATs.

See *CDNA and PHLN Testing Framework for COVID-19 in Australia* for guidance on local approaches to testing, including key priority groups based on the likelihood of infection and the epidemiological situation.

Guidance on Personal Protective Equipment (PPE) for specimen collection is available from *ICEG-endorsed infection control guidance*.

Who to test for SARS-CoV-2

People who have at least one of the following COVID-19 like symptoms should test for SARS-CoV-2:

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory symptoms (e.g. cough, shortness of breath, sore throat); or
- Loss of smell or loss of taste.

Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite.

Testing following a possible vaccine-related adverse event

If a vaccine recipient has not had known contact with a confirmed COVID-19 case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Stay at home requirements after COVID-19 testing

Health care workers providing testing services should clearly communicate the following stay at home requirements after COVID-19 testing:

1. Symptomatic people who have tested for SARS-CoV-2 should stay at home until they receive a negative test, regardless of vaccination status.

2. Asymptomatic people who are not close contacts do not need to stay at home whilst awaiting a negative test result, unless instructed to stay at home by a public health authority.

See Management of Contacts for guidance on quarantine and testing of close contacts.

Assessing indeterminate and suspected false positive NAA results

PHUs should have processes in place with laboratories to manage equivocal results, which may include repeat testing.

Indeterminate or inconclusive NAA results

Indeterminate results may occur due to low viral loads; persistent shedding; or non-SARS-CoV-2 reactivity in the NAAT. In these circumstances, PHUs should contact the laboratory microbiologist to discuss the results and decide whether further testing is required. Consider results in the context of the clinical and epidemiological circumstances to inform whether further public health action is required.

Suspected false positive NAA results

PHUs might suspect a false positive SARS-CoV-2 NAA result when there are no epidemiological risk factors for COVID-19. This is particularly relevant for jurisdictions with low or no community transmission with high levels of enhanced testing.

If a false positive NAAT result is suspected, PHUs should contact the laboratory microbiologist to obtain more details of the test results before designating the result a false positive. The laboratory microbiologist will investigate whether there is evidence of laboratory error or non-specific reactivity in the NAAT, and ascertain whether further testing of the sample is required. If further laboratory investigations provide convincing evidence the case is negative, the test may be considered a false positive and the laboratory will issue an amended report.

For more information on the possible sources of false positive NAAT results, see *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

Case management

Response times

Confirmed cases:

For timely follow up of cases, PHUs should use automated case management systems that utilise self-managed contact tracing. Where feasible, jurisdictions may complete case interviews, exposure site identification and contact tracing by phone. Phone-based public health follow up would typically be used in situations where case numbers are very low, where new cases have been identified in settings previously without cases (such as remote communities), in some settings with vulnerable cases and contacts, and where SMS or other automated follow up is not practical.

In exceptional circumstances, some PHU staff may be required to contribute to the expert assessment of patients under investigation on hospital clinician or general practitioner request.

Probable cases:

Where feasible, conduct follow up of probable cases as per confirmed cases (see above).

Response procedure

Genomic sequencing

Genomic sequencing is an important part of SARS-COV-2 surveillance and can be used to monitor transmission dynamics, identify lineages of concern, and inform outbreak investigation and public health response.

Where community transmission is established, it may not be justifiable to attempt to sequence every COVID-19 case. In these situations, PHUs should employ prioritisation strategies based on their jurisdiction's epidemiological context, capacity and priorities. This approach balances the costs and benefits of real-time SARS-CoV-2 genomic surveillance, where there is rapid spread of a dominant variant.

The *CDGN, PHLN and CDNA Sampling strategy for SARS-CoV-2 genomic surveillance* provides guiding principles and outlines an approach to selective and targeted sequencing. This includes guidance on priority groups for targeted sampling (e.g. international travellers).

For further information, see:

- *PHLN guidance on laboratory testing for SARS-CoV-2*
- *Testing Framework for COVID-19 in Australia*
- *Australian National Disease Surveillance Plan for COVID-19*

Case investigation

Where feasible, PHUs should respond to COVID-19 case notifications as soon as possible via a case interview. However, where public health capacity is exceeded, PHUs can automate and prioritise case investigation processes (e.g. SMS based questionnaires). This may include automated surveys to collect only essential information that will assist with risk stratification, prioritisation of cases for public health follow up and surveillance. Priority cases include people in high-risk settings or situations.

PHUs can use Appendix A - COVID-19 PHU checklist and their state or territory COVID-19 case report as a guide for case investigation.

If automated case management systems are utilised, PHUs should direct cases to self-isolate and provide them with information on how to isolate from others in their residence and what supports are available. PHUs should also provide information detailing how to conduct case-initiated contact management and how to access medical care.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. For further advice on c*linical management, see:*

- *WHO*
- *National COVID-19 Clinical Evidence Taskforce*
- *Cochrane Library: Coronavirus (COVID-19)*

Prophylaxis against severe disease:

Proactive use of monoclonal antibody therapy in people at high risk of developing severe disease may help prevent hospitalisation if it is administered within the first five days of developing symptoms. PHUs, in conjunction with the local clinical team, can help identify cases for clinical treatment early. For further information on emerging clinical treatments, see *National COVID-19 Clinical Evidence Taskforce*.

Education

PHUs should provide access to educational resources about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Hospitalised COVID-19 patients

To minimise the risk of transmission from hospitalised COVID-19 patients, PHUs should encourage hospitals to undertake a system based risk assessment. Hospitals can manage risk by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Hospitalised confirmed or probable cases should isolate in a negative pressure room with anteroom, where available. If a negative pressure room is not available, the hospitalised case can isolate in a standard isolation room or single room with negative airflow as an alternative. Avoid rooms with positive pressure airflow.

If there is concern about a potential exposure related to a hospitalised case, PHUs should assist with providing resources to support risk assessment of hospital staff, visitors or other patients to determine whether further public health response is required (See Health and residential care workers).

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Release from isolation

Release from isolation criteria for all confirmed or probable cases

Updates to the release from isolation criteria have been made in response to the National Cabinet's decision to *reset TTIQ measures in the context of high case numbers and the Omicron variant* and the *AHPPC statement on TTIQ in high levels of COVID-19 community transmission in the context of high levels of COVID-19 transmission.*

Revisions have been made for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

The following table details release from isolation criteria for all confirmed or probable cases as outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

To calculate the isolation period, day 0 is the day the case took their first positive test. Day 1 is the first full day after the first positive test was taken.

Summary of release from isolation criteria agreed by National Cabinet[4]	
Asymptomatic case	If they remain asymptomatic after 7 days have passed since their first positive test, the case can be released from isolation.
Symptomatic case	If acute respiratory symptoms[5] resolve after 7 days since their first positive test, the case can be released from isolation. If acute respiratory symptoms[4] remain after 7 days since their first positive test, the case should remain in isolation until their acute symptoms have resolved.

In addition to the above criteria, in some high-risk clinical settings, confirmed cases who are significantly immunocompromised[6] may be requested to meet the below additional criteria:

- Negative NAAT on at least two consecutive respiratory specimens collected at least 24 hours apart, after 7 days have passed since the first positive test; OR

[4] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

[5] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner can make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[6] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who: have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; are receiving dialysis; or other conditions specifically noted by the treating medical practitioner.

- Negative RAT on at least two consecutive respiratory specimens collected at least 24 hours apart, after 14 days have passed since the since the first positive test.

Testing after release from isolation

Recovered cases should be tested for SARS-CoV-2 if they develop new symptoms of COVID-19 at least 4 weeks[7] after release from isolation.

If at least 4 weeks have passed after release from isolation, and a recovered case has a re-exposure that is outside their immediate household, or there is a new case in their household (and the recovered case had previously isolated away from their household), the recovered case should be managed as a contact.

In the absence of a re-exposure, recovered cases that are asymptomatic do not need to be retested within 4 weeks after release from isolation[2].

Release from isolation and high-risk settings

Cases returning to a high-risk setting can be released from isolation based on the above criteria and do not need to meet a higher standard/ additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met RFI criteria, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

However, there is some laboratory based evidence that a small proportion of people with a previous SARS-CoV-2 variant infection may still be infectious despite fulfilling RFI criteria.

Hospitalised patients who are being transferred to another ward or hospital should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met. People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non COVID-19 related condition.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

[7] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

7. Contacts

Close contact definition

The aim of contact tracing is to interrupt transmission of SARS-CoV-2 through identification and quarantining of people in contact with infectious cases. PHUs can use the below close contact criteria to identify and prioritise people who have been exposed and potentially incubating the disease.

Updates to the close contact definition have been made in response to the National Cabinet's decision to *reset TTIQ measures in the context of high case numbers and the Omicron variant* and the *AHPPC statement on TTIQ in high levels of COVID-19 community transmission in the context of high levels of COVID-19 transmission*.

Revisions have been made for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous definitions have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

The following definitions have been adapted from the definition outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Contact classification[8]	Type of contact made during the case's infectious period
Close contact	A person who resides with or stays overnight in the same premises or has had more than 4 hours of cumulative contact with a COVID-19 case in a residential setting[9]. In exceptional circumstances or where a significant transmission event has occurred, PHUs may consider classifying additional persons as close contacts.
Other contact	A person who has been exposed to a COVID-19 case but does not meet the definition of a close contact.

Some jurisdictions have developed risk matrices for classification of close contacts in certain settings (e.g. for schools, workplaces). The rationale for risk assessment guidance is to balance COVID-19 transmission risk with the risk of furloughing staff to the extent that the business becomes non-operational. Such guidance will take account of specific risk mitigations within the operation of the business.

[8] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

[9] A residential setting is a building or a part of a building where individuals: spend the night for sleeping; including a house, apartment, or other private dwelling, and share facilities for acts of daily living which have the potential to create exposure between co- residents.

Residential settings may include: aged care facilities, military residential settings, boarding schools, boarding houses, homeless shelters, and maritime vessels

Note that:

- For contact tracing, the infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).
- If the case is asymptomatic, the infectious period is the period extending from 48 hours before the initial positive test until the case is classified as no longer infections (refer to Release from isolation).
- For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, see Health and residential care workers.

Management of contacts

Jurisdictions with community transmission may devolve contact management practices to other methods such as automated identification and management of contacts. Jurisdictions may also provide public information to support self-managed contact tracing, testing and quarantine. PHUs may direct cases to follow up their own contacts and tell them to follow relevant public health advice.

Quarantine and testing of close contacts

Close contacts who have recovered from COVID-19 do not need to quarantine if:

- they remain asymptomatic;
- they are not immunocompromised; and
- re-exposure is less than 4 weeks since release from isolation (see Testing after release from isolation).

The following table has adapted the quarantine and testing requirements outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made to quarantine and testing requirements for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

To calculate the quarantine period, day 0 is considered the last day the close contact had contact with the COVID-19 case. Day 1 is the first full day after the close contact no longer has contact with the COVID-19 case.

Contact classification	Testing recommendations and quarantine requirements[10] (regardless of vaccination status)
Close contact	**Testing recommendations** • Where feasible, get a RAT/NAAT if symptoms develop. • Where feasible, get a RAT on day 6 or 7 of quarantine.

[10] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

	Quarantine requirements
	• Quarantine for 7 days after the day they last had contact with a COVID-19 case in their household and monitor for COVID-19 symptoms.
	• If getting a RAT is not feasible, continue quarantine for 10 days from the date of exposure.
	• If the day 6 or 7 RAT is negative, the close contact has no symptoms, and there are no new cases in the household, the close contact may exit quarantine at day 7.
	• If new cases are identified in the household, PHUs may request the close contact and their household to continue quarantine for an additional 7 days after identification of the last household case.
	• If a positive RAT is returned at any time during quarantine, the close contact is now a probable case and should isolate until they meet the release from isolation criteria.
	Other recommendations
	• In the 7 days after exiting quarantine:
	  ○ Wear a mask when outside home.
	  ○ Monitor for COVID-19 symptoms. If the close contact becomes symptomatic, the close contact should isolate and be tested (RAT or NAAT).
	  ○ Where applicable, follow the requirements and guidance of high-risk settings.

Other contact	**Quarantine requirements** • No quarantine is required. **Other recommendations** • Monitor for symptoms for 14 days following exposure to a COVID-19 case. Where feasible, get a RAT/NAAT if symptoms develop. • If a positive RAT is returned at any time within the 14 days following exposure to a COVID-19 case, the contact is now a probable case and should isolate until they meet the release from isolation criteria.

Health and residential care workers

For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by exposure risk, see *Work Permissions and Restrictions Framework for Workers in Health Care Settings*.

In the context of an outbreak and community transmission, this framework supports safe decision making when determining whether to place work permissions/restrictions, independent of quarantine, on a worker after a COVID-19 exposure in a health care setting.

Aircraft passengers

PHUs may classify aircraft passengers seated in the same row or two rows in front or behind a confirmed COVID-19 case during the case's infectious period as close contacts. PHUs can use similar criteria for people who have had close contact on bus or train trips.

Other factors PHUs may consider when determining close contacts among passengers include possible interactions within airport terminals, such as sitting in gate lounges and moving between gates, and transport to, from and within the airport.

For domestic flights, jurisdictions may consider alternative ways of managing passengers who may be contacts of COVID-19 cases, such as posting flight details on a website and issuing public health alerts.

Quarantine and essential workers

Close contacts who are essential workers in a critical infrastructure industry should work from their quarantine location (e.g. home, hotel) and/or implement alternate staffing arrangements wherever possible. Where this is not feasible, PHUs should conduct an individual risk assessment to identify if some essential workers can be permitted to maintain normal work patterns while in quarantine.

This should only occur in circumstances where there is risk of grave damage to Australian national interests and security if the worker is unable to work. If permitted to maintain normal work patterns, the essential worker must practise vigilant physical distancing and hand and respiratory hygiene, and wear a mask whilst at work. They should adhere to normal quarantine restrictions when outside of essential work activities.

Medical care for quarantined individuals

PHUs should advise close contacts that if they require medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department and advise them of their close contact status before presenting. Close contacts with severe symptoms should call 000 and clearly communicate to the emergency services operator that they are a close contact. Close contacts should wear a mask before presenting to any health care setting.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

8. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

9. Special situations

Use of COVID-19 vaccination in outbreak situations

Targeted vaccination of defined populations who may be at risk of exposure is an important activity complementing existing public health interventions. Targeted vaccination may increase the proportion of people who have received one dose, are fully vaccinated, or have received a booster dose of a COVID-19 vaccination (where eligible).

In an outbreak, PHUs can use COVID-19 vaccination to:

1. Reduce the number and severity of COVID-19 cases in an outbreak, where there is likely to be an ongoing risk of exposure.
2. Opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

Key considerations about using COVID-19 vaccines during outbreaks include: the location, target population, context of the outbreak, local epidemiology of COVID-19, and timing of potential exposure.

Vaccination as an outbreak response tool is of greatest use in geographic areas or populations with low vaccination coverage. However, public communications should emphasise the importance of people getting vaccinated even in areas of high coverage.

PHUs can also use COVID-19 vaccination in closed settings where there is an ongoing risk of exposure due to multiple chains of transmission. Example settings include residential aged care facilities, correctional facilities, remote industrial sites (e.g. mining camps) or educational institutions.

In these contexts, vaccination may provide both direct protection against severe illness and death, and indirect protection by limiting outbreak size and duration.

Where possible, PHUs should evaluate the effectiveness of vaccination campaigns in limiting the impacts of COVID-19 at the conclusion of the outbreak.

International travellers

Quarantine requirements for international travellers entering Australia are different for fully vaccinated versus partially or unvaccinated arrivals. It is important to note that the definition of fully vaccinated for international travel purposes differs to the definition included in this guidance. For more information about vaccination and international travel, pre-flight testing and travel requirements, see *International travel and COVID-19* and *Coronavirus (COVID-19) FAQs – international travellers to Australia*.

Schools

The best way to prevent transmission of COVID-19 in schools is through the promotion of correct hand hygiene habits and cough/sneeze etiquette. Children or staff with respiratory symptoms should not attend school while symptomatic. If a child or staff member becomes ill with respiratory symptoms, they should be isolated from other students and sent home as soon as possible.

Contact tracing or management of school outbreaks may require temporary full or partial school closures; however, closures are not generally recommended as a reactive measure on public health grounds.

Workplaces

If a confirmed case has attended the workplace while infectious, PHUs can assist workplaces to conduct a risk assessment of potential workplace transmission. This includes assisting workplaces in the identification of workers who have had close contact with the infected worker. PHUs should provide workplaces with a general framework to help with internal risk assessment. In settings with high vaccine coverages, PHUs may take a more considered approach to risk assessment to ensure that economic and social costs are minimised. For more information, see *Safe Work Australia's COVID-19 information for workplaces* or jurisdictional COVID-19 work health and safety guidance.

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11. Appendices

Appendix A: Public health unit checklist

Using the appropriate jurisdictional investigation form or program, contact the patient or their doctor to:

- Confirm the onset date and symptoms of the illness.
- Confirm results of relevant pathology tests, or recommend that tests be done, including repeat tests where relevant.
- Confirm vaccination status including vaccine type, date and country of administration.
- Where applicable and feasible, seek the doctor's permission to contact the case or relevant care-giver.
- Review case management including:
    - infection control measures being used in caring for the case; and
    - home isolation procedures are being followed.
- Ensure appropriate infection control measures are followed in caring for the case.

Interview the case or care-giver to complete exposure and contact history and other details

- Complete the exposure history and other sections of the relevant jurisdictional investigation form.
- Identify close contacts according to the contact definition.
- Identify the likely source of infection.
- Determine if the case has attended settings that are at higher risk for infection.

Follow-up case's contacts to:

- Assess risk of COVID-19 transmission and identify any close contacts.
- Determine current symptoms, if any, and manage as a suspect case if present.
- Explain symptoms, advise on active daily monitoring of symptoms by the PHU (close contacts) where feasible and need to immediately report any new symptoms.
- Explain to all close contacts the need for quarantine.
- Provide state based factsheets as appropriate.
- Arrange NAA and serological testing if available and contact is symptomatic, and follow local policy for testing in an outbreak setting. Seek protocol on this from the reference laboratory or central communicable disease agency where necessary.
- For cases in schools, aged care facilities, correctional and detention facilities, and Aboriginal and Torres Strait Islander communities, relevant guidelines should be followed. Refer to High-risk settings and Special situations for links to guidelines.

Notify central jurisdictional communicable disease control agency, if they do not already know.

Central communicable disease control agency to notify Commonwealth Department of Health Office of Health Protection and follow the cross-border protocol for notifying cases to other jurisdictions as appropriate.

Consider need for media release and designate a media spokesperson.

Appendix B: Outbreak investigation and management

Definitions

Outbreak:	For the purposes of investigation, an outbreak is defined as a single confirmed case of COVID-19 in the community.
Index case:	An index case is defined as the first confirmed COVID-19 case reported to a health agency that is part of an outbreak.
Primary case:	A primary case is the first confirmed COVID-19 case that occurred in the outbreak.

Outbreak investigation for specific settings

The following guidance relates to the general epidemiological investigation and response to an outbreak. Outbreak investigation and management differs depending on the specific context.

Some identified high-risk settings have specific guidance for the prevention, control and public health management of COVID-19 outbreaks. These include:

- Residential care facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia*.
- Disability residential services:
  See *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – the disability supplement*.
- Correctional and detention facilities:
  See *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.
- Aboriginal and Torres Strait Islander communities:
  See *CDNA national guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA national guidance for urban and regional Aboriginal and Torres Strait Islander communities for COVID-19*.

Steps in outbreak investigation

1. Define the scope of the outbreak

COVID-19 outbreaks can occur in a range of settings where people congregate. This may include group residential settings, Aboriginal and Torres Strait Islander communities, schools, gyms, workplaces, places of worship, or other public places.

A single case of COVID-19 in the community should trigger an extensive review of potential exposure sites or settings for an outbreak. A case may have visited several settings while infectious leading to multiple related investigations.

Identifying potential exposure sites where cases may have visited while infectious is critically important. To achieve high levels of control, PHUs should use a conservative approach to identifying exposure sites or settings. Affected exposure sites can be scaled back once additional investigation and/or testing is completed.

2. Confirm and declare a COVID-19 outbreak

For the purposes of investigation, a single COVID-19 case in the community is considered an outbreak to initiate active case finding and supplement routine case and contact follow-up.

3. Establish governance structures and lines of responsibility

PHUs are the lead agency in COVID-19 outbreaks, however, management and governance arrangements may vary depending on the context. In some contexts (such as outbreaks in group residential settings) PHUs should collaborate with managers of the setting to form a dedicated outbreak management team (OMT). Guidance on who should be included in an OMT can be found in the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* and *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

4. Identify and inform relevant internal and external stakeholders

It is important to ensure transparent and clear messaging about the outbreak to stakeholders, particularly when investigation and management follows an extended testing strategy. PHUs should also identify other agencies involved in the oversight and management of the facility or setting.

5. Case interview

The case interview will help determine the number of contacts requiring follow up and classification of close contacts.

6. Contact tracing

A proactive approach to contact tracing is required in order to minimise potential transmission in the community. The PHU should contact all persons who have attended the setting or facility, and are deemed to be close contacts. These include, staff, residents (if relevant) and visitors.

PHUs may need to use multiple communication methods to alert people of exposure where infectious cases have visited multiple venues and exposure sites.

7. Contact management

PHUs should ensure all close contacts are quarantined and undergo testing as outlined in Management of Contacts guidance. Some PHUs may also require secondary close contacts or casual contacts to quarantine.

I. Identify those most at risk of severe disease

Identify and document those at highest risk of severe disease as described in *Advice for people at risk of COVID-19*. Monitor those at risk of severe disease for symptoms.

I. Assess and record vaccination status

During outbreak investigations, it is important for PHUs to assess all exposed individuals' vaccination status and capture it to estimate vaccine effectiveness. Vaccine type and timing of doses should be recorded routinely on case investigation forms.

8. Arrange COVID-19 testing for all people who attended the setting or exposure site

When an index case is likely to have acquired their infection within the setting or facility, it is likely there are already other transmission chains. Widespread testing of those exposed should help identify people who may be shedding virus or were part of the transmission chain.

Consider if serological tests are available to identify persons previously infected. See *PHLN guidance for serological testing in COVID-19* for more information.

If others who attended or live in the specific setting or facility are symptomatic and receive a negative SARS-CoV-2 test result, consider testing for other respiratory pathogens such as influenza.

9. Assist with notifying all people who attended the setting or exposure site

Ensure managers of an affected setting or facility notify all staff, visitors and residents (if relevant) that cases of COVID-19 have occurred within the specific setting or facility. Advice about who should be tested and quarantined must be clear. Management of the affected setting or facility should take a strong leadership role in responding to the outbreak with support from PHU staff.

10. Isolate and treat individuals who test positive

All confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

11. Advise staff about implementation of enhanced infection prevention and control (IPC) measures and develop a process for ongoing IPC observation

In certain settings, such as health and residential care facilities, there may be a need to enhance IPC in response to an outbreak of COVID-19. Enhanced IPC measures are detailed in the Infection Control Expert Group's *COVID-19 Infection Prevention and Control for Residential Care Facilities*. While the advice in these guidelines is tailored specifically to residential care facilities, these principles and actions can be applied to any setting where there is potential for rapid transmission.

Residential care facilities and other high-risk settings should ensure all staff have completed the IPC training relevant for their workplace, in person or online as required (e.g. COVID-19training.gov.au). Facility managers may consider appointing a specific staff member to observe day-to day practices, provide advice as needed and report daily to the OMT.

12. Descriptive epidemiology

Throughout the course of the investigation, epidemiologists should describe the epidemiology of cases associated with the outbreak. This may be as simple as collating information into a line list describing people infected in terms of time, place, and person. A map of the setting (such as those used to identify evacuation points) may be useful to identify case locations. Seek staff rosters for employees who have been in close proximity to the index case. Consider diagrams for chains of infection.

Consider information that may assist with investigation of the source of introduction of disease, such as exposure type and ventilation patterns. This seeks to identify other chains of transmission in the community that may be unrecognised. For further information, see identification of potential source ('upstream') contacts.

At each stage of investigation, consideration should be given to the collection of data which may be valuable for future epidemiological investigation.

13. Ensure enhanced environmental cleaning of the setting

Regular, scheduled cleaning is essential during an outbreak. Frequently touched surfaces should be cleaned more often. These surfaces include:

- equipment
- door handles
- trays
- tables
- handrails
- chair arms
- light switches

During a suspected or confirmed COVID-19 outbreak, an increase in the frequency of cleaning and disinfection is recommended.

Detailed information on environmental cleaning and disinfection in health and residential care settings is in the *COVID-19 Environmental cleaning and disinfection principles for health and residential care facilities factsheet*. Disinfectants registered with the TGA as effective against the virus (SARS-CoV-2) are listed on the TGA website.

Additional instructions for group residential settings

14. Quarantine exposed individuals who test negative and monitor for illness

Individuals who have attended the affected setting during a COVID-19 cases' infectious period but test negative still require protection from any possible further exposure. Monitor these individuals for symptoms and consider a program of repeat testing.

15. Consider a program of repeat testing for those in quarantine who initially test negative

Repeat testing of people in quarantine can assist in identification of those who are pre-symptomatic or asymptomatic.

In group residential settings, frequent facility-wide repeat testing of both staff and residents is recommended until it is clear there is no ongoing spread of infection. Those already identified as positive do not require further diagnostic testing.

As described in *Table 1: Repeat testing and ongoing actions for outbreaks in residential settings* (see below):

a) With each round of testing, those who are NAA positive can be removed to positive cohort isolation wherever possible.
b) In subsequent rounds, only those who are NAA negative (i.e. those who may be susceptible) should be tested.
c) Symptom screening should be conducted daily for the negative (quarantined) cohort.

Table 1: Repeat testing and ongoing actions for outbreaks in residential settings

	Testing overview		Date for quarantine	
	Day 1	**Repeat Testing Days (where feasible)**	**Quarantine Cohort Day 1**	**Quarantine Cohort on Retest Day/s**
Recommended testing and actions	**Who to test** □ Test all members of the setting via NAA. **Actions** □ Isolate positive persons (may designate an area to cohort positive cases). □ Quarantine cohort of negative residents (an off-site quarantine site may suit depending on the setting). Where possible, people who initially test negative should be quarantined separately.	**Who to test** □ Re-test NAA negative cohort where feasible (e.g. 72 hourly) A subset of the quarantined cohort may be re-tested if appropriate. **Actions** □ Isolate positive persons □ Quarantine cohort of NAA negative residents and screen for symptoms. □ Where possible, people who initially test negative should be quarantined separately.	Recommended quarantine period (see quarantine and restriction of close contacts) starts from date that the quarantine cohort are NAA negative	If any of the quarantined cohort are positive: 1. Recommence recommended quarantine period (see quarantine and restriction of close contacts) 2. Consider retesting every 72 hours until no new NAA positive tests.

16. For group residential settings, identify suitable sites where individuals may be cohorted or zoned into either isolation (symptomatic or SARS-CoV-2 positive) OR quarantine (exposed)

People who require isolation should be cared for separately to protect those in quarantine. Residents who have not been exposed should avoid exposure to both isolated and quarantined individuals.

Residents and staff from affected areas, wings or buildings should not work in unaffected areas.

Staff working at a facility with an outbreak should only work within one cohort and not move between those in isolation and those in quarantine. They should not work at a different facility for the duration of the outbreak. Staff should be regularly screened for symptoms, in addition to participating in whole of setting testing.

In some group residential settings (such as residential care facilities) consideration should be given to transferring NAA positive individuals to a suitable hospital or hospital-equivalent setting. If confirmed cases remain within the group residential setting, specific staff should be allocated to support and care for NAA positive isolated individuals.

The facility should ensure that staff members:

- Do not move between their allocated room/section and other areas of the facility or care for other residents.
- Follow guidelines for IPC and correct use of PPE.

Staff in outbreak settings

Staff working in a facility or setting where an outbreak is occurring should not enter a high-risk setting until the outbreak is declared over (from 14 days following the date of isolation of the last case). All staff should self-monitor for symptoms of acute respiratory illness and self-exclude from work if unwell, even if appropriate PPE has been used or there was no obvious contact with a known case.

The setting should maintain a register for all staff and volunteers to check for symptoms of COVID-19 at the beginning of every shift. Contact details of attendees, contractors and other people visiting the setting should also be recorded. There may be a need to undertake frequent or daily screening of staff in an outbreak or high risk setting.

Declaring an outbreak over

In most circumstances, a COVID-19 outbreak can be declared over if no new cases occur within 14 days (maximum incubation period) following the date of isolation of the last case.

Once the outbreak is over, PHUs should ensure cluster reports are provided to relevant stakeholders, and data are summarised appropriately.

Repeat testing allows for close observation of the outbreak and clarity regarding when it can be declared over.

Appendix C: Risk assessment and identification of close contacts in aircrew

These recommendations are intended to assist PHUs to undertake risk assessments, in collaboration with airlines, to identify which aircrew are close contacts of a confirmed COVID-19 case. These recommendations relate to the specific circumstance where an ill passenger or crew member has travelled on a flight and potentially exposed aircrew. It is important to note that an infected person may be infectious up to 48 hours prior to onset of symptoms and while asymptomatic. Any risk assessment needs to consider that a person may appear well, but still be infectious.

This risk assessment is directed at identifying aircrew close contacts. For more information on contact tracing of aircraft passengers see Close Contacts- Aircraft passengers and crew.

General principles

- Case-by-case risk assessments should be conducted by the relevant PHU, in collaboration with airlines, to identify close contacts among aircrew where one or more confirmed cases of COVID-19 were present on a flight.
- As part of risk assessments, PHUs should consider whether aircrew have adhered to adequate infection control precautions (including the use of appropriate PPE, physical distancing and separate donning/doffing areas).
- Risk assessments for aircrew should be consistent with criteria for being a close contact.

Considerations for conducting risk assessments

For aircraft crew exposed to a confirmed case, a case-by-case risk assessment should be conducted by the PHU, in collaboration with the airline, to identify which crew members should be managed as close contacts.

Appropriate use of PPE and adhering to documented infection control procedures is an important consideration for assessing the risk for aircrew. This should include considerations about use of separate resting areas for crew and adherence to PPE and physical distancing while on layovers and airports. The PHUs should determine this for all crew on affected flights. Where a PHU considers that both PPE and infection control are adequate throughout the potential exposure period, crew may be excluded as close contacts.

Additional considerations for conducting a risk assessment should include:

1. **Variants of concern**
   If the passenger is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

2. **Proximity of crew to confirmed cases**
   Crew who have had face-to-face contact with an infected passenger of any duration during the course of the flight may be considered close contacts. Face to face contact may include provision of in-flight service, checking in a passenger and their baggage, or answering page calls.

3. **Duration of exposure to confirmed cases**
   Crew who provided prolonged periods (e.g. one hour) of in-flight service in the section of the aircraft where the infected passenger was seated should be considered close contacts.

4. **Size of the compartment in which the crew and confirmed case interacted**
   Subject to considerations about aircraft design and airflow patterns, crew who provided in-flight service of any duration in confined sections (e.g. first or business class) or within two rows of where the infected passenger was seated should be considered close contacts.

5. **The number of confirmed cases of COVID-19 on board**
   More than one case on board a flight may represent a higher risk to aircrew and should be factored into the risk assessment.

6. **Potential breaches of PPE**
   Crew who experienced potential breaches of PPE whilst providing assistance to an infected passenger (e.g. emergency medical assistance) should be considered close contacts.

Considerations for when the confirmed COVID-19 case is an aircrew member:

Where the confirmed COVID-19 case is an aircrew member, all crew should be considered close contacts unless there is evidence that they did not have face-to-face contact with the case. In this circumstance, PHUs will concentrate contact tracing efforts on passengers seated in the area where the crew member worked during the flight along with other members of the crew. Additionally, PHUs may consider factors such as common use of facilities, transport to and from work, and communal resting/dining areas. The same general principles and considerations detailed above can also be adapted to identify close contacts in these circumstances.

If an aircrew member is infected (or suspected to be infected) with a SARS-CoV-2 variant of concern, PHUs may consider classifying all aircrew and passengers on board the flight as close contacts.

Aircrew and passengers who are close contacts

If an airline becomes aware of a crew member or passenger who was a close contact of a confirmed case whilst on board a flight, they should notify the local PHU to facilitate management of the close contacts. For more information, see Appendix D: Guidance on the management of aircrew.

Appendix D: Guidance on the management of aircrew

1. Aircrew who test positive for SARS-CoV-2 in Australia

Aircrew who test positive in Australia and who are still in quarantine in Australia when the positive test result is notified should remain in isolation in Australia until they meet the release from isolation criteria. Note that those who meet the release from isolation criteria for a historical infection should be allowed to leave Australia, including as working crew.

Under exceptional circumstances aircrew who have tested positive for COVID-19 may be permitted to return overseas where the following conditions are met:

- the affected crew member is asymptomatic;
- the return flight does not carry any passengers;
- all other aircrew on board the flight wear PPE and practice physical distancing;
- where possible, the infectious crew member is isolated in a separate segment of the plane;
- the airline is aware and accepts the risk to crew and endorses the travel; and the receiving country is aware.

2. Aircrew who are a close contact of a person with confirmed COVID-19

Aircrew who are a close contact of a person with confirmed COVID-19 can be permitted to leave Australia if they are asymptomatic and the returning aircraft does not carry any passengers, PPE is worn by all on board and physical distancing is practiced.

Under certain circumstances a close contact can return on a passenger flight and where appropriate risk mitigation is in place. This might be that the close contact remains asymptomatic, is in an area completely separate to passengers, for example in a separate first- class section of the plane with a dedicated toilet.

3. Return to Australia of infected crew and crew who are close contacts

Aircrew who have tested positive for COVID-19 should not return to Australia within 14 days of their onset of symptoms and until there has been resolution of symptoms of the acute illness for at least 72 hours (note the 14 day period covers the situation where the infection is due to a variant of concern).

Aircrew who are a close contact should not return to Australia within 14 days of their last known exposure to a case.

Note that the above applies to instances where the case/close contact departed Australia prior to the result for the positive person being available, as well as instances where the close contact was in Australia at the time that the positive result was notified.

Jurisdictions can advise airlines that should individual crew return in the above time frames they will then be placed in isolation/quarantine in a managed hotel on arrival. Information on individuals and their relevant exclusion period may be shared between jurisdictions via the NIR.

4. Crew with historical infections

Aircrew with a recent history of COVID-19 infection who swab positive on a SARS-COV-2 NAA test can be considered a historical infection and do not require follow-up as a confirmed case if they meet the following criteria:

- the NAAT has high Ct values (as defined by the testing laboratory);
- the person is asymptomatic;
- the person has evidence of a previous positive NAAT for SARS-COV-2 between 10 days and 8 weeks ago; and
- the person is not known to have been in contact with a confirmed case in the previous 14 days.

5. Onward domestic travel of aircrew who are Australian residents

Aircrew who have been tested on arrival into Australia and are not known to be a close contact of a person with infectious COVID-19 are permitted to travel onto their jurisdiction of residence if they travel on a flight with only aircrew on board (no passengers), PPE and physical distancing are undertaken, and there is COVID-safe travel transit/travel to the domestic airport (including an overnight stay in managed hotel quarantine if required).

If the above measures cannot be implemented, then they are required to quarantine for 14 days at point of entry prior to onward travel.

Jurisdictions should inform the receiving jurisdiction of any incoming aircrew who are completing onward domestic travel following an international flight.

Appendix E: Full revision history of the COVID-19 SoNG

Revision history

Version	Date	Revised by	Changes
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts

Version	Date	Revised by	Changes
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C

Version	Date	Revised by	Changes
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.

Version	Date	Revised by	Changes
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.

Version	Date	Revised by	Changes
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.

Version	Date	Revised by	Changes
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 6.5

21 February 2022

Summary of revision history

For full revision history, refer to Appendix A

Version	Date	Revised by	Changes
6.5	21 February 2022	Communicable Diseases Network Australia	Updated: Key definitions, The Disease, Routine prevention activities, Testing, Management of contacts, Special situations, Appendices
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the *WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020*.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the *Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses*.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for COVID-19. Jurisdictions may adapt this guidance based on local epidemiological context.

Guidance within this document reflects Australia's progress through the *National Plan to transition Australia's National COVID-19 Response* and the evolving COVID-19 situation in Australia.

Updates have been made in response to the National Cabinet's decision to *reset TTIQ measures in the context of high case numbers and the Omicron variant*, including the *usage of rapid antigen tests (RATs)*, as well as the *AHPPC statement on TTIQ in high levels of COVID-19 community transmission*.

Additionally, this document contains revised case and contact management guidance as detailed in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

CDNA has revised the guidance in this document for pragmatic reasons in response to a context of high case prevalence, altered policy settings and increased risk tolerance, and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

For detailed guidance on infection prevention and control, refer to *Infection Control Expert Group (ICEG) endorsed infection prevention and control guidance*.

Public health priority

Urgent – initiate public health responses as soon as possible. Public health responses may be automated and prioritised to assist with maintaining public health workforce capacity.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

Hospitalised confirmed cases should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of confirmed COVID-19 patients, including personal protective equipment (PPE), *see ICEG-endorsed infection control guidance*.

Contact management

PHUs should manage close contacts according to management of contacts guidance.

2. Key definitions

Community transmission

Community transmission, in this guidance refers to when there are multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction.

Up-to-date COVID-19 vaccination status

Please note, for the purpose of being up-to-date in the Australian Immunisation Register (which does not contain any information on medical conditions), a total of 3 doses will be counted as being up-to-date. For more information see *ATAGI statement on defining up to date status for COVID-19 vaccination*.

For individuals aged 16 years and over

Receipt of homologous (same brand) or heterologous (different brand) primary schedule of 2 doses of any TGA approved or TGA recognised COVID-19 vaccine at least 14 days apart, except for Janssen COVID-19 Vaccine where only 1 dose is required AND receipt of a booster dose of a TGA approved vaccine (Pfizer, Moderna, or AstraZeneca) at a recommended interval of 3 months after receipt of the last dose of a primary schedule, and not later than 6 months (i.e. within 3 months of becoming eligible).

For individuals aged 5 to 15 years

Receipt of a homologous or heterologous primary schedule of two doses of any TGA approved or TGA recognised COVID-19 vaccine at least 14 days apart. A booster dose is currently not required. ATAGI will update advice on up-to-date status if and when boosters are recommended for children and adolescents in these age groups.

For immunocompromised aged 5 years and over

To remain up-to-date, severely immunocompromised individuals aged 5 years and over require an additional dose of a COVID-19 vaccine in the primary schedule, 2-6 months after the previous dose. Those aged 16 years and over are recommended a booster dose, 3 months after dose 3 of their primary vaccination course.

Reinfection

A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed COVID-19 that is determined to be a separate episode to the first based on epidemiological and/or laboratory findings. SARS-CoV-2 RNA detection must be greater than 4 weeks after the first laboratory confirmed infection to be considered reinfection. Wherever feasible, whole genome sequencing should be undertaken for suspected reinfections.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

3. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. Human coronaviruses often cause mild illness in humans, such as the coronaviruses that cause the common cold. Animal coronaviruses can sometimes evolve to infect people and then spread between people resulting in serious epidemics. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. Further investigation is required to confirm the origin of SARS-CoV-2 (1).

Mode of transmission

SARS-CoV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (2). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (2).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of early SARS-CoV-2 variants ranged from 2–4 (3). R_0 for confined settings were potentially at the higher end of this range.

Preliminary evidence indicates that the Omicron variant has a transmission advantage over previous variants in highly vaccinated populations likely due to immune escape and increased inherent transmissibility (4, 5).

SARS-CoV-2 variants of concern or interest

The Communicable Diseases Genomics Network (CDGN) actively monitors variants and their reported mutations to understand how they influence the behaviour of the virus.

Some variants are classified as ‘variants of concern’ (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (6, 7). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted ‘variants under investigation’ or ‘variants of interest’.

For more information see*: PHLN statement on reporting of SARS-COV-2 variants of concern and interest*.

Incubation period

The median incubation period is 5 to 6 days, with a range of 1 to 14 days (8-10). Around 1% of COVID-19 cases developed symptoms more than 14 days after exposure (11). Some studies

suggest that the incubation period of more recent SARS-CoV-2 variants may be shorter than wild type SARS-COV-2 (12-14).

There is currently limited evidence to determine how the incubation period for breakthrough infection in vaccinated individuals may differ from infection in unvaccinated individuals.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (15, 16). Pre-symptomatic transmission can occur 1-3 days before symptom onset (17, 18). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (19).

Clinical presentation and outcome

The most common symptoms of COVID-19 are fever, cough, shortness of breath, sore throat and loss of smell or loss of taste. Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite.

Evidence suggests that the severity of infection with the Omicron variant is less than previous strains. Observational studies indicate that people infected with the Omicron variant are less likely to be hospitalised than patients infected with the previous variants (20).

Case fatality rate

As at 17 February 2022, the crude case fatality rate (CFR) for confirmed cases reported globally is approximately 1.4% (51). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, including how this may change over time, especially for mild cases, and the impact of health systems and patient outcomes. Mortality is influenced by individual risk factors, vaccination status, and health care quality and access. As of 17 February 2022, a total of 4798 COVID-19 deaths have been reported in Australia and 35% (1693/4798) of COVID-19 deaths have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19;
- Are caring for COVID-19 cases; or
- Come in contact with people with a higher likelihood of having active infection.

Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

4. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and, as much as possible, disease transmission.

As of February 2022, the Australian Technical Advisory Group on Immunisation (ATAGI) recommends vaccination for all individuals aged 5 years and over in a two-dose vaccine schedule (3 doses for severely immunocompromised individuals) for the COVID-19 vaccines currently available in Australia. ATAGI recommends the use of a single booster dose for anyone aged 16 years and older who completed their primary COVID-19 vaccine course 3 or more months ago. For more information, see *Clinical guidance for COVID-19 vaccine providers* and *ATAGI statement on defining up to date status for COVID-19 vaccination*.

The COVID-19 vaccines registered for use in Australia have all been shown to be highly effective against severe disease, including previous SARS-CoV-2 variants of concern (21). There is very strong evidence that COVID-19 vaccination protects against severe disease due to the Omicron variant (22). Existing vaccine safety monitoring systems have been strengthened, with weekly COVID-19 vaccine safety reports provided by the Therapeutic Goods Administration and AusVaxSafety active surveillance system.

Other prevention activities

When combined, prevention and control activities can help limit the spread of certain respiratory diseases, including COVID-19. These measures may include:

1. Physical distancing and gathering
    - Physical distancing can reduce the potential for transmission. Physical distancing measures may include:
        - maintaining a distance of 1.5m from people
        - density restrictions; and
        - limits on the number of people allowed to participate in an event.
2. Environmental controls, such as optimised ventilation
3. Personal hygiene
    - PHUs should encourage good hygiene practices to prevent SARS-CoV-2 infection including:
        - wearing a face mask where physical distancing cannot be maintained, particularly indoors;
        - staying home if unwell;

- effective hand and respiratory hygiene; and
- cleaning surfaces

4. Travel restrictions
    - Some jurisdictions will require quarantine or testing of domestic and international travellers. See *COVID-19 FAQs- international travellers to Australia.*

5. Surveillance

There are five main objectives of surveillance for COVID-19, which are to rapidly:

1. Identify, isolate and manage cases.
2. Identify, quarantine and provide relevant information to contacts.
3. Detect and manage clusters and outbreaks.
4. Characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place;
    - describing the transmission dynamics;
    - identifying groups at special risk of infection or more severe disease; and
    - monitoring for SARS-CoV-2 variants.
5. Monitor the effectiveness of the following routine prevention and control activities, in managing the COVID-19 outbreak over time:
    - vaccination;
    - test, trace, isolate and quarantine processes; and
    - public health and social measures.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit when notified of a confirmed case of COVID-19 or death in an infected person. Jurisdictions can determine reporting requirements for probable cases (e.g. requiring probable cases to self-report positive RAT results).

Where possible, PHUs should collect information regarding the case's age, sex, comorbidities, vaccination status, place of residence, occupation, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status and likely place of acquisition.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

PHUs should enter initial information on confirmed cases of COVID-19 onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one

working day of the notification/report. Enter enhanced surveillance data shortly after case follow-up. Jurisdictions are encouraged to prioritise and automate as many of these processes as possible, including linking COVID-19 cases to clinical services.

Surveillance of variants of concern

Early identification of cases, where there is a high probability of infection with a VOC such as the Omicron variant, can inform appropriate public health responses. Ideally, these VOC are identified through whole genome sequencing. Omicron primary test results with spike gene target failure may indicate probable infection with this variant. Where possible, public health reference laboratories should confirm the infecting strain using whole genome sequencing, although this may not be possible where large numbers of cases are occurring.

Jurisdictions can refer to the *CDGN Laboratory Case Definitions for SARS-CoV-2 Variants of Concern* for more information.

6. Cases

Definitions

Reporting

Notify confirmed cases in the jurisdiction of public health management. Jurisdictions can determine reporting requirements for probable cases.

People meeting the confirmed or probable case criteria who were previously diagnosed and managed overseas or in another Australian jurisdiction in the past 4 weeks[1] do not need to be re-notified. In this situation, the person should provide documented evidence of diagnosis overseas or interstate to the PHU.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic amplification acid testing (NAAT);

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a NAAT;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Probable case

A probable case includes individuals who have laboratory suggestive evidence

Laboratory suggestive evidence:

Detection of SARS-CoV-2 by rapid antigen testing (RAT)

[1] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

Testing

Specimen collection and testing for SARS-CoV-2

Nucleic acid amplification testing (NAAT) (for example, using reverse transcription polymerase chain reaction (RT-PCR) or transcription-mediated amplification (TMA) is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection.

For advice on selecting a suitable sample for diagnostic NAAT for SARS-CoV-2, specimen handling in the laboratory and different types of SARS-CoV-2 specific testing, see *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Guidance on Personal Protective Equipment (PPE) for specimen collection is available from *ICEG-endorsed infection control guidance*.

Rapid antigen tests

Rapid antigen tests (RATs) are an alternative testing method, providing fast results following the collection of a respiratory sample. The sensitivity of RATs are inherently lower than NAAT and performance of different RATs can vary from test to test.

In the context of widespread community transmission, PHLN and CDNA recommend deployment of RATs to enhance and preserve laboratory-based testing capacity. Specific guidance on the use of RATs is outlined in the *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests.* This statement describes how RATs may be effectively used to enhance Australia's COVID-19 response, while mitigating associated potential limitations and risks.

Guidance implemented may be decided at the discretion of the relevant state or territory in line with the *Testing Framework for COVID-19 in Australia*. The Testing Framework provides guidance on the use and appropriateness of different testing methods within four defined epidemiological zones.

Who to test for SARS-CoV-2

People who have at least one of the following COVID-19 like symptoms should test for SARS-CoV-2:

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory symptoms (e.g. cough, shortness of breath, sore throat); or
- Loss of smell or loss of taste.

Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite.

Testing following a possible vaccine-related adverse event

If a vaccine recipient has not had known contact with a confirmed COVID-19 case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Stay at home requirements after COVID-19 testing

Health care workers providing testing services should clearly communicate the following stay at home requirements after COVID-19 testing:

1. Symptomatic people who have tested for SARS-CoV-2 should stay at home until they receive a negative test, regardless of vaccination status.
2. Asymptomatic people who are not close contacts do not need to stay at home whilst awaiting a test result, unless instructed to stay at home by a public health authority.

See Management of Contacts for guidance on quarantine and testing of close contacts.

Assessing indeterminate and suspected false positive NAAT results

Indeterminate (equivocal) or suspected false positive results may occur due to low viral copy numbers; persistent shedding; or non-SARS-CoV-2 target reactivity in the NAAT.

Where feasible (i.e. in settings where laboratories are operating within their capacity), it is recommended that PHUs should contact the laboratory specialist microbiologist (pathologist) to discuss the results and decide whether further testing is required. Consider results in the context of the clinical and epidemiological circumstances to inform whether further laboratory or public health action is required.

For more information on indeterminate results and the possible sources of false positive NAAT results, see *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

Case management

Response times

Confirmed cases:

For timely follow up of cases, PHUs should use automated case management systems that utilise self-managed contact tracing. Where feasible, jurisdictions may complete case interviews, exposure site identification and contact tracing by phone. Phone-based public health follow up would typically be used in situations where case numbers are very low, where new cases have been identified in settings previously without cases (such as remote communities), in some settings with vulnerable cases and contacts, and where SMS or other automated follow up is not practical.

In exceptional circumstances, some PHU staff may be required to contribute to the expert assessment of patients under investigation on hospital clinician or general practitioner request.

Probable cases:

Where feasible, conduct follow up of probable cases as per confirmed cases (see above).

Response procedure

Genomic sequencing

Genomic sequencing is an important part of SARS-COV-2 surveillance and can be used to monitor transmission dynamics, identify lineages of concern, and inform outbreak investigation and public health response.

Where community transmission is established, it may not be justifiable to attempt to sequence every COVID-19 case. In these situations, PHUs should employ prioritisation strategies based on their jurisdiction's epidemiological context, capacity and priorities. This approach balances the costs and benefits of real-time SARS-CoV-2 genomic surveillance, where there is rapid spread of a dominant variant.

The *CDGN, PHLN and CDNA Sampling strategy for SARS-CoV-2 genomic surveillance* provides guiding principles and outlines an approach to selective and targeted sequencing. This includes guidance on priority groups for targeted sampling (e.g. international travellers).

For further information, see:

- *PHLN guidance on laboratory testing for SARS-CoV-2*
- *Testing Framework for COVID-19 in Australia*
- *Australian National Disease Surveillance Plan for COVID-19*

Case investigation

Where feasible, PHUs should respond to COVID-19 case notifications as soon as possible via a case interview. However, where public health capacity is exceeded, PHUs can automate and prioritise case investigation processes (e.g. SMS based questionnaires). This may include automated surveys to collect only essential information that will assist with risk stratification, prioritisation of cases for public health follow up and surveillance. Priority cases include people in high-risk settings or situations.

If automated case management systems are utilised, PHUs should direct cases to self-isolate and provide them with information on how to isolate from others in their residence and what supports are available. PHUs should also provide information detailing how to conduct case-initiated contact management and how to access medical care.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. For further advice on c*linical management, see:*

- *WHO*
- *National COVID-19 Clinical Evidence Taskforce*
- *Cochrane Library: Coronavirus (COVID-19)*

Prophylaxis against severe disease:

Proactive use of monoclonal antibody therapy in people at high risk of developing severe disease may help prevent hospitalisation if it is administered within the first five days of developing symptoms. PHUs, in conjunction with the local clinical team, can help identify

cases for clinical treatment early. For further information on emerging clinical treatments, see *National COVID-19 Clinical Evidence Taskforce*.

Education

PHUs should provide access to educational resources about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Hospitalised COVID-19 patients

To minimise the risk of transmission from hospitalised COVID-19 patients, PHUs should encourage hospitals to undertake a system based risk assessment. Hospitals can manage risk by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Hospitalised confirmed or probable cases should isolate in a negative pressure room with anteroom, where available. If a negative pressure room is not available, the hospitalised case can isolate in a standard isolation room or single room with negative airflow as an alternative. Avoid rooms with positive pressure airflow.

If there is concern about a potential exposure related to a hospitalised case, PHUs should assist with providing resources to support risk assessment of hospital staff, visitors or other patients to determine whether further public health response is required (See Health and residential care workers).

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Release from isolation

Release from isolation criteria for all confirmed or probable cases

The following table details release from isolation criteria for all confirmed or probable cases as outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

To calculate the isolation period, day 0 is the day the case took their first positive test. Day 1 is the first full day after the first positive test was taken.

Summary of release from isolation criteria agreed by National Cabinet[3]	
Asymptomatic case	If they remain asymptomatic after 7 days have passed since their first positive test, the case can be released from isolation.
Symptomatic case	If acute respiratory symptoms[4] resolve after 7 days since their first positive test, the case can be released from isolation. If acute respiratory symptoms are not resolved after 7 days since their first positive test, the case should remain isolated until their acute symptoms have resolved.

In addition to the above criteria, in some high-risk clinical settings, confirmed cases who are significantly immunocompromised[5] may be requested to meet the below additional criteria:

- Negative NAAT on at least two consecutive respiratory specimens collected at least 24 hours apart, after 7 days have passed since the first positive test; OR
- Negative RAT on at least two consecutive respiratory specimens collected at least 24 hours apart, after 14 days have passed since the since the first positive test.

[3] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

[4] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner can make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[5] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who: have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; are receiving dialysis; or other conditions specifically noted by the treating medical practitioner.

Testing after release from isolation

Recovered cases should be tested for SARS-CoV-2 if they develop new symptoms of COVID-19 at least 4 weeks[6] after release from isolation.

If at least 4 weeks have passed after release from isolation, and a recovered case has a re-exposure that is outside their immediate household, or there is a new case in their household (and the recovered case had previously isolated away from their household), the recovered case should be managed as a contact.

In the absence of a re-exposure, recovered cases that are asymptomatic do not need to be retested within 4 weeks after release from isolation[2].

Release from isolation and high-risk settings

Cases returning to a high-risk setting can be released from isolation based on the above criteria and do not need to meet a higher standard/ additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met RFI criteria, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

However, there is some laboratory based evidence that a small proportion of people with a previous SARS-CoV-2 variant infection may still be infectious despite fulfilling RFI criteria.

Hospitalised patients who are being transferred to another ward or hospital should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met. People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non COVID-19 related condition.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

[6] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

7. Contacts

Close contact definition

The aim of contact tracing is to interrupt transmission of SARS-CoV-2 through identification and quarantining of people in contact with infectious cases. PHUs can use the below close contact criteria to identify and prioritise people who have been exposed and potentially incubating the disease.

The following definitions have been adapted from the definition outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous definitions have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

Contact classification[7]	Type of contact made during the case's infectious period
Close contact	A person who resides with or stays overnight in the same premises or has had more than 4 hours of cumulative contact with a COVID-19 case in a residential setting[8]. In exceptional circumstances or where a significant transmission event has occurred, PHUs may consider classifying additional persons as close contacts.
Other contact	A person who has been exposed to a COVID-19 case but does not meet the definition of a close contact.

Some jurisdictions have developed risk matrices for classification of close contacts in certain settings (e.g. for schools, workplaces). The rationale for risk assessment guidance is to balance COVID-19 transmission risk with the risk of furloughing staff to the extent that the business becomes non-operational. Such guidance will take account of specific risk mitigations within the operation of the business.

Note that:

- For contact tracing, the infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

[7] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

[8] A residential setting is a building or a part of a building where individuals: spend the night for sleeping; including a house, apartment, or other private dwelling, and share facilities for acts of daily living which have the potential to create exposure between co- residents.

Residential settings may include: aged care facilities, military residential settings, boarding schools, boarding houses, homeless shelters, and maritime vessels

- If the case is asymptomatic, the infectious period is the period extending from 48 hours before the initial positive test until the case is classified as no longer infections (refer to Release from isolation).
- For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, see Health and residential care workers.

Management of contacts

Jurisdictions may devolve contact management practices to other methods such as automated identification and management of contacts. Jurisdictions may also provide public information to support self-managed contact tracing, testing and quarantine. PHUs may direct cases to follow up their own contacts and tell them to follow relevant public health advice.

Quarantine and testing of close contacts

Close contacts who have recovered from COVID-19 do not need to quarantine if:

- they remain asymptomatic;
- they are not immunocompromised; and
- re-exposure is less than 4 weeks since release from isolation (see Testing after release from isolation).

The following table has adapted the quarantine and testing requirements outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made to quarantine and testing requirements for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

To calculate the quarantine period, day 0 is considered the date that the first positive sample was collected from the primary case. Day 1 is the first full day after the primary case's positive test was taken.

Regardless of whether any new cases are identified in the household, all household close contacts will undertake a static 7-day quarantine period, with day 0 being the date that a positive sample was collected from the primary case, or for household-like contacts, the date of last exposure to the COVID-19 case.

Contact classification	Testing recommendations and quarantine requirements[9] (regardless of vaccination status)
Close contact	**Testing recommendations** • RAT/NAAT if symptoms develop • RAT on day 1 of quarantine • RAT on day 6 or 7 of quarantine

[9] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

	Quarantine requirements
	• Quarantine for 7 days after the day the primary case took their first positive test (or date of last exposure to the primary case for household-like contacts) and monitor for COVID-19 symptoms.
	• If the day 6 or 7 RAT is negative and the close contact has no symptoms, they can exit quarantine at day 7.
	• If a close contact has symptoms and they return a negative RAT, the close contact should get a NAAT as soon as possible. If it is not feasible to get a NAAT, the close contact should get a second RAT 24 hours later.
	• If a positive RAT or NAAT is returned at any time during quarantine, the close contact should isolate until they meet the release from isolation criteria.
	Other recommendations
	• In the 7 days after exiting quarantine:
	  ○ Wear a mask when outside home.
	  ○ Monitor for COVID-19 symptoms. If the close contact becomes symptomatic, the close contact should isolate and be tested (RAT or NAAT).
	  ○ Where applicable, follow the requirements and guidance of high-risk settings.

Other contact	**Quarantine requirements** • No quarantine is required. **Other recommendations** • Monitor for symptoms for 14 days following exposure to a COVID-19 case. Where feasible, get a RAT/NAAT if symptoms develop. • If a positive RAT or NAAT is returned at any time within the 14 days following exposure to a COVID-19 case, the close contact should isolate until they meet the release from isolation criteria.

Health care and essential workers

For guidance on work permissions and restrictions for essential workers, PHUs can refer to the *National Cabinet's Interim Guidance on Permissions and Restrictions for Essential Workers*. This essential workers interim guidance outlines a process to support decision making when determining whether to place work permissions/restrictions on an essential worker who is subject to isolation or quarantine. This guidance presents a pragmatic approach to reduce the impact on workforce availability caused by increased case numbers and transmissibility of the Omicron variant.

The interim guidance has been developed by National Cabinet, taking into consideration the current context of the pandemic, including significant vaccination coverage in Australia, the commencement of booster vaccination, the emergence of Omicron, and likely future

progression. The interim guidance aims to allow for greater flexibility in balancing the need to reduce transmission against workforce shortages and consequent impacts on essential services.

For guidance on health care specific settings, PHUs can refer to *Permissions and Restrictions for Workers in Health Care Settings – Interim Guidance* for guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by exposure risk.

Medical care for quarantined individuals

PHUs should advise close contacts that if they require medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department and advise them of their close contact status before presenting. Close contacts with severe symptoms should call 000 and clearly communicate to the emergency services operator that they are a close contact. Close contacts should wear a mask before presenting to any health care setting.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

8. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

9. Special situations

Use of COVID-19 vaccination in outbreak situations

Targeted vaccination of defined populations who may be at risk of exposure is an important activity complementing existing public health interventions. Targeted vaccination may increase the proportion of people who have received one dose, are fully vaccinated, or have received a booster dose of a COVID-19 vaccination (where eligible).

In an outbreak, PHUs can use COVID-19 vaccination to:

1. Reduce the number and severity of COVID-19 cases in an outbreak, where there is likely to be an ongoing risk of exposure.
2. Opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

Key considerations about using COVID-19 vaccines during outbreaks include: the location, target population, context of the outbreak, local epidemiology of COVID-19, and timing of potential exposure.

Vaccination as an outbreak response tool is of greatest use in geographic areas or populations with low vaccination coverage. However, public communications should emphasise the importance of people getting vaccinated even in areas of high coverage.

PHUs can also use COVID-19 vaccination in closed settings where there is an ongoing risk of exposure due to multiple chains of transmission. Example settings include residential aged care facilities, correctional facilities, remote industrial sites (e.g. mining camps) or educational institutions.

In these contexts, vaccination may provide both direct protection against severe illness and death, and indirect protection by limiting outbreak size and duration.

Where possible, PHUs should evaluate the effectiveness of vaccination campaigns in limiting the impacts of COVID-19 at the conclusion of the outbreak.

Schools

Schools and Early Childhood Education and Care (ECEC) facilities may implement a variety of strategies to reduce COVID-19 transmission, including:

- Cohorting and staggering class schedules
- Use of RAT (either for symptomatic people or routine screening)
- Mask wearing at relevant ages
- Improvement in ventilation/teaching in outdoor settings where feasible
- Optional hybrid or remote learning

Schools and ECEC facilities are responsible for implementing risk mitigation strategies and outbreak response plans in line with jurisdictional guidance.

Jurisdictions have developed operational plans for schools, taking into consideration the objectives and guiding principles of the *National Framework for Managing COVID-19 in Schools and Early Childhood Education and Care (ECEC)*. Key objectives outlined in this framework include protection of vulnerable students and staff at higher risk of severe

disease, minimising disruption to face-to-face learning, minimising transmission and minimising broader workforce disruptions for parents and carers.

Jurisdictions may also recommend additional measures for boarding schools due to increased transmission risk and consequences associated with infection. This may involve requiring boarding schools to have clear isolation/quarantine plans in place and clear messaging to parents and carers about the risks associated with boarding.

International travellers

For information on international travel, pre-flight testing and travel requirements, see *International travel and COVID-19* and *Coronavirus (COVID-19) FAQs – international travellers to Australia*.

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11. Appendix A: Full revision history

Version	Date	Revised by	Changes
6.5	21 February 2022	Communicable Diseases Network Australia	Updated: Key definitions, The Disease, Routine prevention activities, Testing, Management of contacts, Special situations, Appendices
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings

Version	Date	Revised by	Changes
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.

Version	Date	Revised by	Changes
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.

Version	Date	Revised by	Changes
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 6.6

02 March 2022

Summary of revision history

For full revision history, refer to Appendix A

Version	Date	Revised by	Changes
6.6	02 March 2022	Communicable Diseases Network Australia	Updated: Reinfection definition, Release from isolation criteria, Management of contacts
6.5	21 February 2022	Communicable Diseases Network Australia	Updated: Key definitions, The Disease, Routine prevention activities, Testing, Management of contacts, Special situations, Appendices
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the *WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020*.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the *Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses*.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for COVID-19. Jurisdictions may adapt this guidance based on local epidemiological context.

Guidance within this document reflects Australia's progress through the *National Plan to transition Australia's National COVID-19 Response* and the evolving COVID-19 situation in Australia.

Updates have been made in response to the National Cabinet's decision to *reset TTIQ measures in the context of high case numbers and the Omicron variant*, including the *usage of rapid antigen tests (RATs)*, as well as the *AHPPC statement on TTIQ in high levels of COVID-19 community transmission*.

Additionally, this document contains revised case and contact management guidance as detailed in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

CDNA has revised the guidance in this document for pragmatic reasons in response to a context of high case prevalence, altered policy settings and increased risk tolerance, and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

For detailed guidance on infection prevention and control, refer to *Infection Control Expert Group (ICEG) endorsed infection prevention and control guidance*.

Public health priority

Urgent – initiate public health responses as soon as possible. Public health responses may be automated and prioritised to assist with maintaining public health workforce capacity.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

Hospitalised confirmed cases should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of confirmed COVID-19 patients, including personal protective equipment (PPE), *see ICEG-endorsed infection control guidance*.

Contact management

PHUs should manage close contacts according to management of contacts guidance.

2. Key definitions

Community transmission

Community transmission, in this guidance refers to when there are multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction.

Up-to-date COVID-19 vaccination status

Please note, for the purpose of being up-to-date in the Australian Immunisation Register (which does not contain any information on medical conditions), a total of 3 doses will be counted as being up-to-date. For more information see *ATAGI statement on defining up to date status for COVID-19 vaccination*.

For individuals aged 16 years and over

Receipt of homologous (same brand) or heterologous (different brand) primary schedule of 2 doses of any TGA approved or TGA recognised COVID-19 vaccine at least 14 days apart, except for Janssen COVID-19 Vaccine where only 1 dose is required AND receipt of a booster dose of a TGA approved vaccine (Pfizer, Moderna, or AstraZeneca) at a recommended interval of 3 months after receipt of the last dose of a primary schedule, and not later than 6 months (i.e. within 3 months of becoming eligible).

For individuals aged 5 to 15 years

Receipt of a homologous or heterologous primary schedule of two doses of any TGA approved or TGA recognised COVID-19 vaccine at least 14 days apart. A booster dose is currently not required. ATAGI will update advice on up-to-date status if and when boosters are recommended for children and adolescents in these age groups.

For immunocompromised aged 5 years and over

To remain up-to-date, severely immunocompromised individuals aged 5 years and over require an additional dose of a COVID-19 vaccine in the primary schedule, 2-6 months after the previous dose. Those aged 16 years and over are recommended a booster dose, 3 months after dose 3 of their primary vaccination course.

Reinfection

A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed or probable COVID-19 that is determined to be a separate episode to the first based on epidemiological and/or laboratory findings. SARS-CoV-2 RNA detection must be greater than 8 weeks after release from isolation from the first infection to be considered reinfection. Reinfection requires confirmatory NAAT. Wherever feasible, whole genome sequencing should be undertaken for suspected reinfections.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed or probable COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

3. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. Human coronaviruses often cause mild illness in humans, such as the coronaviruses that cause the common cold. Animal coronaviruses can sometimes evolve to infect people and then spread between people resulting in serious epidemics. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. Further investigation is required to confirm the origin of SARS-CoV-2 (1).

Mode of transmission

SARS-CoV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (2). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (2).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of early SARS-CoV-2 variants ranged from 2–4 (3). R_0 for confined settings were potentially at the higher end of this range.

Preliminary evidence indicates that the Omicron variant has a transmission advantage over previous variants in highly vaccinated populations likely due to immune escape and increased inherent transmissibility (4, 5).

SARS-CoV-2 variants of concern or interest

The Communicable Diseases Genomics Network (CDGN) actively monitors variants and their reported mutations to understand how they influence the behaviour of the virus.

Some variants are classified as ‘variants of concern’ (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (6, 7). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted ‘variants under investigation’ or ‘variants of interest’.

For more information see*: PHLN statement on reporting of SARS-CoV-2 variants of concern and interest*.

Incubation period

The median incubation period is 5 to 6 days, with a range of 1 to 14 days (8-10). Around 1% of COVID-19 cases developed symptoms more than 14 days after exposure (11). Some studies

suggest that the incubation period of more recent SARS-CoV-2 variants may be shorter than wild type SARS-CoV-2 (12-14).

There is currently limited evidence to determine how the incubation period for breakthrough infection in vaccinated individuals may differ from infection in unvaccinated individuals.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (15, 16). Pre-symptomatic transmission can occur 1-3 days before symptom onset (17, 18). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (19).

Clinical presentation and outcome

The most common symptoms of COVID-19 are fever, cough, shortness of breath, sore throat and loss of smell or loss of taste. Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite.

Evidence suggests that the severity of infection with the Omicron variant is less than previous strains. Observational studies indicate that people infected with the Omicron variant are less likely to be hospitalised than patients infected with the previous variants (20).

Case fatality rate

As at 1 March 2022, the crude case fatality rate (CFR) for confirmed cases reported globally is approximately 1.4% (21). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, including how this may change over time, especially for mild cases, and the impact of health systems and patient outcomes. Mortality is influenced by individual risk factors, vaccination status, and health care quality and access. As of 1 March 2022, a total of 5212 COVID-19 deaths have been reported in Australia and 34% (1793/5212) of COVID-19 deaths have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19;
- Are caring for COVID-19 cases; or
- Come in contact with people with a higher likelihood of having active infection.

Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

4. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and, as much as possible, disease transmission.

As of February 2022, the Australian Technical Advisory Group on Immunisation (ATAGI) recommends vaccination for all individuals aged 5 years and over in a two-dose vaccine schedule (3 doses for severely immunocompromised individuals) for the COVID-19 vaccines currently available in Australia. ATAGI recommends the use of a single booster dose for anyone aged 16 years and older who completed their primary COVID-19 vaccine course 3 or more months ago. For more information, see *Clinical guidance for COVID-19 vaccine providers* and *ATAGI statement on defining up to date status for COVID-19 vaccination*.

The COVID-19 vaccines registered for use in Australia have all been shown to be highly effective against severe disease, including previous SARS-CoV-2 variants of concern (22). There is very strong evidence that COVID-19 vaccination protects against severe disease due to the Omicron variant (23). Existing vaccine safety monitoring systems have been strengthened, with weekly COVID-19 vaccine safety reports provided by the Therapeutic Goods Administration and AusVaxSafety active surveillance system.

Other prevention activities

When combined, prevention and control activities can help limit the spread of certain respiratory diseases, including COVID-19. These measures may include:

1. Physical distancing and gathering
    - Physical distancing can reduce the potential for transmission. Physical distancing measures may include:
        - maintaining a distance of 1.5m from people
        - density restrictions; and
        - limits on the number of people allowed to participate in an event.
2. Environmental controls, such as optimised ventilation
3. Personal hygiene
    - PHUs should encourage good hygiene practices to prevent SARS-CoV-2 infection including:
        - wearing a face mask where physical distancing cannot be maintained, particularly indoors;
        - staying home if unwell;

- effective hand and respiratory hygiene; and
- cleaning surfaces

4. Travel restrictions
    - Some jurisdictions will require quarantine or testing of domestic and international travellers. See *COVID-19 FAQs- international travellers to Australia.*

5. Surveillance

There are five main objectives of surveillance for COVID-19, which are to rapidly:

1. Identify, isolate and manage cases.
2. Identify, quarantine and provide relevant information to contacts.
3. Detect and manage clusters and outbreaks.
4. Characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place;
    - describing the transmission dynamics;
    - identifying groups at special risk of infection or more severe disease; and
    - monitoring for SARS-CoV-2 variants.
5. Monitor the effectiveness of the following routine prevention and control activities, in managing the COVID-19 outbreak over time:
    - vaccination;
    - test, trace, isolate and quarantine processes; and
    - public health and social measures.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit when notified of a confirmed case of COVID-19 or death in an infected person. Jurisdictions can determine reporting requirements for probable cases (e.g. requiring probable cases to self-report positive RAT results).

Where possible, PHUs should collect information regarding the case's age, sex, comorbidities, vaccination status, place of residence, occupation, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status and likely place of acquisition.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

PHUs should enter initial information on confirmed cases of COVID-19 onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one

working day of the notification/report. Enter enhanced surveillance data shortly after case follow-up. Jurisdictions are encouraged to prioritise and automate as many of these processes as possible, including linking COVID-19 cases to clinical services.

Surveillance of variants of concern

Early identification of cases, where there is a high probability of infection with a VOC such as the Omicron variant, can inform appropriate public health responses. Ideally, these VOC are identified through whole genome sequencing. Omicron primary test results with spike gene target failure may indicate probable infection with this variant. Where possible, public health reference laboratories should confirm the infecting strain using whole genome sequencing, although this may not be possible where large numbers of cases are occurring.

Jurisdictions can refer to the *CDGN Laboratory Case Definitions for SARS-CoV-2 Variants of Concern* for more information.

6. Cases

Definitions

Reporting

Notify confirmed cases in the jurisdiction of public health management. Jurisdictions can determine reporting requirements for probable cases.

People meeting the confirmed or probable case criteria who were previously diagnosed and managed overseas or in another Australian jurisdiction in the past 8 weeks[1] do not need to be re-notified. In this situation, the person should provide documented evidence of diagnosis overseas or interstate to the PHU.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic amplification acid testing (NAAT);

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a NAAT;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Probable case

A probable case includes individuals who have laboratory suggestive evidence

Laboratory suggestive evidence:

Detection of SARS-CoV-2 by rapid antigen testing (RAT)

[1] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

Testing

Specimen collection and testing for SARS-CoV-2

Nucleic acid amplification testing (NAAT) (for example, using reverse transcription polymerase chain reaction (RT-PCR) or transcription-mediated amplification (TMA) is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection.

For advice on selecting a suitable sample for diagnostic NAAT for SARS-CoV-2, specimen handling in the laboratory and different types of SARS-CoV-2 specific testing, see *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Guidance on Personal Protective Equipment (PPE) for specimen collection is available from *ICEG-endorsed infection control guidance*.

Rapid antigen tests

Rapid antigen tests (RATs) are an alternative testing method, providing fast results following the collection of a respiratory sample. The sensitivity of RATs are inherently lower than NAAT and performance of different RATs can vary from test to test.

In the context of widespread community transmission, PHLN and CDNA recommend deployment of RATs to enhance and preserve laboratory-based testing capacity. Specific guidance on the use of RATs is outlined in the *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests.* This statement describes how RATs may be effectively used to enhance Australia's COVID-19 response, while mitigating associated potential limitations and risks.

Guidance implemented may be decided at the discretion of the relevant state or territory in line with the *Testing Framework for COVID-19 in Australia*. The Testing Framework provides guidance on the use and appropriateness of different testing methods within four defined epidemiological zones.

Who to test for SARS-CoV-2

People who have at least one of the following COVID-19 like symptoms should test for SARS-CoV-2:

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory symptoms (e.g. cough, shortness of breath, sore throat); or
- Loss of smell or loss of taste.

Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite.

Testing following a possible vaccine-related adverse event

If a vaccine recipient has not had known contact with a confirmed COVID-19 case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Stay at home requirements after COVID-19 testing

Health care workers providing testing services should clearly communicate the following stay at home requirements after COVID-19 testing:

1. Symptomatic people who have tested for SARS-CoV-2 should stay at home until they receive a negative test, regardless of vaccination status.
2. Asymptomatic people who are not close contacts do not need to stay at home whilst awaiting a test result, unless instructed to stay at home by a public health authority.

See Management of Contacts for guidance on quarantine and testing of close contacts.

Assessing indeterminate and suspected false positive NAAT results

Indeterminate (equivocal) or suspected false positive results may occur due to low viral copy numbers; persistent shedding; or non-SARS-CoV-2 target reactivity in the NAAT.

Where feasible (i.e. in settings where laboratories are operating within their capacity), it is recommended that PHUs should contact the laboratory specialist microbiologist (pathologist) to discuss the results and decide whether further testing is required. Consider results in the context of the clinical and epidemiological circumstances to inform whether further laboratory or public health action is required.

For more information on indeterminate results and the possible sources of false positive NAAT results, see *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

Case management

Response times

Confirmed cases:

For timely follow up of cases, PHUs should use automated case management systems that utilise self-managed contact tracing. Where feasible, jurisdictions may complete case interviews, exposure site identification and contact tracing by phone. Phone-based public health follow up would typically be used in situations where case numbers are very low, where new cases have been identified in settings previously without cases (such as remote communities), in some settings with vulnerable cases and contacts, and where SMS or other automated follow up is not practical.

In exceptional circumstances, some PHU staff may be required to contribute to the expert assessment of patients under investigation on hospital clinician or general practitioner request.

Probable cases:

Where feasible, conduct follow up of probable cases as per confirmed cases (see above).

Response procedure

Genomic sequencing

Genomic sequencing is an important part of SARS-CoV-2 surveillance and can be used to monitor transmission dynamics, identify lineages of concern, and inform outbreak investigation and public health response.

Where community transmission is established, it may not be justifiable to attempt to sequence every COVID-19 case. In these situations, PHUs should employ prioritisation strategies based on their jurisdiction's epidemiological context, capacity and priorities. This approach balances the costs and benefits of real-time SARS-CoV-2 genomic surveillance, where there is rapid spread of a dominant variant.

The *CDGN, PHLN and CDNA Sampling strategy for SARS-CoV-2 genomic surveillance* provides guiding principles and outlines an approach to selective and targeted sequencing. This includes guidance on priority groups for targeted sampling (e.g. international travellers).

For further information, see:

- *PHLN guidance on laboratory testing for SARS-CoV-2*
- *Testing Framework for COVID-19 in Australia*
- *Australian National Disease Surveillance Plan for COVID-19*

Case investigation

Where feasible, PHUs should respond to COVID-19 case notifications as soon as possible via a case interview. However, where public health capacity is exceeded, PHUs can automate and prioritise case investigation processes (e.g. SMS based questionnaires). This may include automated surveys to collect only essential information that will assist with risk stratification, prioritisation of cases for public health follow up and surveillance. Priority cases include people in high-risk settings or situations.

If automated case management systems are utilised, PHUs should direct cases to self-isolate and provide them with information on how to isolate from others in their residence and what supports are available. PHUs should also provide information detailing how to conduct case-initiated contact management and how to access medical care.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. For further advice on clinical management, see:

- *WHO*
- *National COVID-19 Clinical Evidence Taskforce*
- *Cochrane Library: Coronavirus (COVID-19)*

Prophylaxis against severe disease:

Proactive use of monoclonal antibody therapy in people at high risk of developing severe disease may help prevent hospitalisation if it is administered within the first five days of developing symptoms. PHUs, in conjunction with the local clinical team, can help identify

cases for clinical treatment early. For further information on emerging clinical treatments, see *National COVID-19 Clinical Evidence Taskforce*.

Education

PHUs should provide access to educational resources about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Hospitalised COVID-19 patients

To minimise the risk of transmission from hospitalised COVID-19 patients, PHUs should encourage hospitals to undertake a system based risk assessment. Hospitals can manage risk by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Hospitalised confirmed or probable cases should isolate in a negative pressure room with anteroom, where available. If a negative pressure room is not available, the hospitalised case can isolate in a standard isolation room or single room with negative airflow as an alternative. Avoid rooms with positive pressure airflow.

If there is concern about a potential exposure related to a hospitalised case, PHUs should assist with providing resources to support risk assessment of hospital staff, visitors or other patients to determine whether further public health response is required (See Health and residential care workers).

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Release from isolation

Release from isolation criteria for all confirmed or probable cases

The following table details release from isolation criteria for all confirmed or probable cases as outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

To calculate the isolation period, day 0 is the day the case took their first positive test. Day 1 is the first full day after the first positive test was taken.

Summary of release from isolation criteria agreed by National Cabinet[3]	
Asymptomatic case	If they remain asymptomatic after 7 days have passed since their first positive test, the case can be released from isolation.
Symptomatic case	If acute respiratory symptoms[4] resolve after 7 days since their first positive test, the case can be released from isolation. If acute respiratory symptoms are not resolved after 7 days since their first positive test, the case should remain isolated until their acute symptoms have resolved.

In addition to the above criteria, in some high-risk clinical settings, confirmed cases who are significantly immunocompromised[5] may be requested to meet the below additional criteria:

- Negative NAAT on at least two consecutive respiratory specimens collected at least 24 hours apart, after 7 days have passed since the first positive test; OR
- Negative RAT on at least two consecutive respiratory specimens collected at least 24 hours apart, after 14 days have passed since the since the first positive test.

[3] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

[4] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner can make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[5] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who: have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; are receiving dialysis; or other conditions specifically noted by the treating medical practitioner.

Testing after release from isolation

Recovered cases do not need to be retested within 8 weeks[6] after release from isolation, regardless of symptoms.

If at least 8 weeks have passed after release from isolation, recovered cases should be tested for SARS-CoV-2 if they develop new symptoms of COVID-19.

If at least 8 weeks have passed after release from isolation, and a recovered case has a re-exposure that is outside their immediate household, or there is a new case in their household (and the recovered case had previously isolated away from their household), the recovered case should be managed as a contact.

Release from isolation and high-risk settings

Cases returning to a high-risk setting can be released from isolation based on the above criteria and do not need to meet a higher standard/ additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met RFI criteria, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

However, there is some laboratory based evidence that a small proportion of people with a previous SARS-CoV-2 variant infection may still be infectious despite fulfilling RFI criteria.

Hospitalised patients who are being transferred to another ward or hospital should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met. People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non COVID-19 related condition.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

[6] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

7. Contacts

Close contact definition

The aim of contact tracing is to interrupt transmission of SARS-CoV-2 through identification and quarantining of people in contact with infectious cases. PHUs can use the below close contact criteria to identify and prioritise people who have been exposed and potentially incubating the disease.

The following definitions have been adapted from the definition outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous definitions have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

Contact classification[7]	Type of contact made during the case's infectious period
Close contact	A person who resides with or stays overnight in the same premises or has had more than 4 hours of cumulative contact with a COVID-19 case in a residential setting[8]. In exceptional circumstances or where a significant transmission event has occurred, PHUs may consider classifying additional persons as close contacts.
Other contact	A person who has been exposed to a COVID-19 case but does not meet the definition of a close contact.

Some jurisdictions have developed risk matrices for classification of close contacts in certain settings (e.g. for schools, workplaces). The rationale for risk assessment guidance is to balance COVID-19 transmission risk with the risk of furloughing staff to the extent that the business becomes non-operational. Such guidance will take account of specific risk mitigations within the operation of the business.

Note that:

- For contact tracing, the infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

[7] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

[8] A residential setting is a building or a part of a building where individuals: spend the night for sleeping; including a house, apartment, or other private dwelling, and share facilities for acts of daily living which have the potential to create exposure between co- residents.

Residential settings may include: aged care facilities, military residential settings, boarding schools, boarding houses, homeless shelters, and maritime vessels

- If the case is asymptomatic, the infectious period is the period extending from 48 hours before the initial positive test until the case is classified as no longer infections (refer to Release from isolation).
- For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, see Health and residential care workers.

Management of contacts

Jurisdictions may devolve contact management practices to other methods such as automated identification and management of contacts. Jurisdictions may also provide public information to support self-managed contact tracing, testing and quarantine. PHUs may direct cases to follow up their own contacts and tell them to follow relevant public health advice.

Quarantine and testing of close contacts

Close contacts who have recovered from COVID-19 do not need to quarantine if:

- they remain asymptomatic;
- they are not immunocompromised; and
- re-exposure is less than 8 weeks since release from isolation (see Testing after release from isolation).

The following table has adapted the quarantine and testing requirements outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made to quarantine and testing requirements for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

To calculate the quarantine period, day 0 is considered the date that the first positive sample was collected from the primary case. Day 1 is the first full day after the primary case's positive test was taken.

Regardless of whether any new cases are identified in the household, all household close contacts will undertake a static 7-day quarantine period, with day 0 being the date that a positive sample was collected from the primary case, or for household-like contacts, the date of last exposure to the COVID-19 case.

Contact classification	Testing recommendations and quarantine requirements[9] (regardless of vaccination status)
Close contact	**Testing recommendations** • RAT/NAAT if symptoms develop • RAT on day 1 of quarantine • RAT on day 6 or 7 of quarantine

[9] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

	Quarantine requirements
	• Quarantine for 7 days after the day the primary case took their first positive test (or date of last exposure to the primary case for household-like contacts) and monitor for COVID-19 symptoms.
	• If the day 6 or 7 RAT is negative and the close contact has no symptoms, they can exit quarantine at day 7.
	• If a close contact has symptoms and they return a negative RAT, the close contact should get a NAAT as soon as possible. If it is not feasible to get a NAAT, the close contact should get a second RAT 24 hours later.
	• If a positive RAT or NAAT is returned at any time during quarantine, the close contact should isolate until they meet the release from isolation criteria.
	Other recommendations
	• In the 7 days after exiting quarantine:
	  ○ Wear a mask when outside home.
	  ○ Monitor for COVID-19 symptoms. If the close contact becomes symptomatic, the close contact should isolate and be tested (RAT or NAAT).
	  ○ Where applicable, follow the requirements and guidance of high-risk settings.

Other contact	**Quarantine requirements** • No quarantine is required. **Other recommendations** • Monitor for symptoms for 14 days following exposure to a COVID-19 case. Where feasible, get a RAT/NAAT if symptoms develop. • If a positive RAT or NAAT is returned at any time within the 14 days following exposure to a COVID-19 case, the close contact should isolate until they meet the release from isolation criteria.

Health care and essential workers

For guidance on work permissions and restrictions for essential workers, PHUs can refer to the *National Cabinet's Interim Guidance on Permissions and Restrictions for Essential Workers*. This essential workers interim guidance outlines a process to support decision making when determining whether to place work permissions/restrictions on an essential worker who is subject to isolation or quarantine. This guidance presents a pragmatic approach to reduce the impact on workforce availability caused by increased case numbers and transmissibility of the Omicron variant.

The interim guidance has been developed by National Cabinet, taking into consideration the current context of the pandemic, including significant vaccination coverage in Australia, the commencement of booster vaccination, the emergence of Omicron, and likely future

progression. The interim guidance aims to allow for greater flexibility in balancing the need to reduce transmission against workforce shortages and consequent impacts on essential services.

For guidance on health care specific settings, PHUs can refer to *Permissions and Restrictions for Workers in Health Care Settings – Interim Guidance* for guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by exposure risk.

Medical care for quarantined individuals

PHUs should advise close contacts that if they require medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department and advise them of their close contact status before presenting. Close contacts with severe symptoms should call 000 and clearly communicate to the emergency services operator that they are a close contact. Close contacts should wear a mask before presenting to any health care setting.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

8. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

9. Special situations

Use of COVID-19 vaccination in outbreak situations

Targeted vaccination of defined populations who may be at risk of exposure is an important activity complementing existing public health interventions. Targeted vaccination may increase the proportion of people who have received one dose, are fully vaccinated, or have received a booster dose of a COVID-19 vaccination (where eligible).

In an outbreak, PHUs can use COVID-19 vaccination to:

1. Reduce the number and severity of COVID-19 cases in an outbreak, where there is likely to be an ongoing risk of exposure.
2. Opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

Key considerations about using COVID-19 vaccines during outbreaks include: the location, target population, context of the outbreak, local epidemiology of COVID-19, and timing of potential exposure.

Vaccination as an outbreak response tool is of greatest use in geographic areas or populations with low vaccination coverage. However, public communications should emphasise the importance of people getting vaccinated even in areas of high coverage.

PHUs can also use COVID-19 vaccination in closed settings where there is an ongoing risk of exposure due to multiple chains of transmission. Example settings include residential aged care facilities, correctional facilities, remote industrial sites (e.g. mining camps) or educational institutions.

In these contexts, vaccination may provide both direct protection against severe illness and death, and indirect protection by limiting outbreak size and duration.

Where possible, PHUs should evaluate the effectiveness of vaccination campaigns in limiting the impacts of COVID-19 at the conclusion of the outbreak.

Schools

Schools and Early Childhood Education and Care (ECEC) facilities may implement a variety of strategies to reduce COVID-19 transmission, including:

- Cohorting and staggering class schedules
- Use of RAT (either for symptomatic people or routine screening)
- Mask wearing at relevant ages
- Improvement in ventilation/teaching in outdoor settings where feasible
- Optional hybrid or remote learning

Schools and ECEC facilities are responsible for implementing risk mitigation strategies and outbreak response plans in line with jurisdictional guidance.

Jurisdictions have developed operational plans for schools, taking into consideration the objectives and guiding principles of the *National Framework for Managing COVID-19 in Schools and Early Childhood Education and Care (ECEC)*. Key objectives outlined in this framework include protection of vulnerable students and staff at higher risk of severe

disease, minimising disruption to face-to-face learning, minimising transmission and minimising broader workforce disruptions for parents and carers.

Jurisdictions may also recommend additional measures for boarding schools due to increased transmission risk and consequences associated with infection. This may involve requiring boarding schools to have clear isolation/quarantine plans in place and clear messaging to parents and carers about the risks associated with boarding.

International travellers

For information on international travel, pre-flight testing and travel requirements, see *International travel and COVID-19* and *Coronavirus (COVID-19) FAQs – international travellers to Australia*.

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11. Appendix A: Full revision history

Version	Date	Revised by	Changes
6.6	02 March 2022	Communicable Diseases Network Australia	Updated: Reinfection definition, Release from isolation criteria, Management of contacts
6.5	21 February 2022	Communicable Diseases Network Australia	Updated: Key definitions, The Disease, Routine prevention activities, Testing, Management of contacts, Special situations, Appendices
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings

Version	Date	Revised by	Changes
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.

Version	Date	Revised by	Changes
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.

Version	Date	Revised by	Changes
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 6.7

22 March 2022

Summary of revision history

For full revision history, refer to Appendix A

Version	Date	Revised by	Changes
6.7	22 March 2022	Communicable Diseases Network Australia	Updated: Release from isolation, Management of contacts
6.6	02 March 2022	Communicable Diseases Network Australia	Updated: Reinfection definition, Release from isolation criteria, Management of contacts
6.5	21 February 2022	Communicable Diseases Network Australia	Updated: Key definitions, The Disease, Routine prevention activities, Testing, Management of contacts, Special situations, Appendices
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
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6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

Abbreviations

COVID-19:	Coronavirus disease 2019. The name of the disease caused by the virus SARS-CoV-2, as agreed by the World Health Organization, the World Organisation for Animal Health and the Food and Agriculture Organization of the United Nations. For more information, refer to the *WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020*.
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19, as determined by the International Committee on Taxonomy of Viruses. Previously, this coronavirus was commonly known as 'novel coronavirus 2019 (2019-nCoV)'. For more information, refer to the *Consensus Statement of the Coronaviridae Study Group of the International Committee on Taxonomy of Viruses*.

CONTENTS

1. Summary

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for COVID-19. Jurisdictions may adapt this guidance based on local epidemiological context.

Guidance within this document reflects Australia's progress through the *National Plan to transition Australia's National COVID-19 Response* and the evolving COVID-19 situation in Australia.

Updates have been made in response to the National Cabinet's decision to *reset TTIQ measures in the context of high case numbers and the Omicron variant*, including the *usage of rapid antigen tests (RATs)*, as well as the *AHPPC statement on TTIQ in high levels of COVID-19 community transmission*.

Additionally, this document contains revised case and contact management guidance as detailed in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

CDNA has revised the guidance in this document for pragmatic reasons in response to a context of high case prevalence, altered policy settings and increased risk tolerance, and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

For detailed guidance on infection prevention and control, refer to *Infection Control Expert Group (ICEG) endorsed infection prevention and control guidance*.

Public health priority

Urgent – initiate public health responses as soon as possible. Public health responses may be automated and prioritised to assist with maintaining public health workforce capacity.

Case management

Confirmed cases must isolate according to isolation and restriction guidance until they meet the appropriate release from isolation criteria.

Hospitalised confirmed cases should be isolated in a negative pressure room with anteroom, where available. For guidance on infection prevention and control for routine care of confirmed COVID-19 patients, including personal protective equipment (PPE), *see ICEG-endorsed infection control guidance*.

Contact management

PHUs should manage close contacts according to management of contacts guidance.

2. Key definitions

Community transmission

Community transmission, in this guidance refers to when there are multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction.

Up-to-date COVID-19 vaccination status

Please note, for the purpose of being up-to-date in the Australian Immunisation Register (which does not contain any information on medical conditions), a total of 3 doses will be counted as being up-to-date. For more information see *ATAGI statement on defining up to date status for COVID-19 vaccination*.

For individuals aged 16 years and over

Receipt of homologous (same brand) or heterologous (different brand) primary schedule of 2 doses of any TGA approved or TGA recognised COVID-19 vaccine at least 14 days apart, except for Janssen COVID-19 Vaccine where only 1 dose is required AND receipt of a booster dose of a TGA approved vaccine (Pfizer, Moderna, or AstraZeneca) at a recommended interval of 3 months after receipt of the last dose of a primary schedule, and not later than 6 months (i.e. within 3 months of becoming eligible).

For individuals aged 5 to 15 years

Receipt of a homologous or heterologous primary schedule of two doses of any TGA approved or TGA recognised COVID-19 vaccine at least 14 days apart. A booster dose is currently not required. ATAGI will update advice on up-to-date status if and when boosters are recommended for children and adolescents in these age groups.

For immunocompromised aged 5 years and over

To remain up-to-date, severely immunocompromised individuals aged 5 years and over require an additional dose of a COVID-19 vaccine in the primary schedule, 2-6 months after the previous dose. Those aged 16 years and over are recommended a booster dose, 3 months after dose 3 of their primary vaccination course.

Reinfection

A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed or probable COVID-19 that is determined to be a separate episode to the first based on epidemiological and/or laboratory findings. SARS-CoV-2 RNA detection must be greater than 12 weeks after release from isolation from the first infection to be considered reinfection. Reinfection requires confirmatory NAAT. Wherever feasible, whole genome sequencing should be undertaken for suspected reinfections.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed or probable COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

3. The disease

Infectious agent

SARS-CoV-2 is the infective agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. Human coronaviruses often cause mild illness in humans, such as the coronaviruses that cause the common cold. Animal coronaviruses can sometimes evolve to infect people and then spread between people resulting in serious epidemics. Mutations allowing human-to-human transmission have led to outbreaks of severe acute respiratory disease due to MERS-CoV and SARS-CoV.

Reservoir

The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests bats and pangolins may be the reservoir for SARS-CoV-2. Further investigation is required to confirm the origin of SARS-CoV-2 (1).

Mode of transmission

SARS-CoV-2 can be transmitted through respiratory droplets, smaller particles (aerosols), direct physical contact with an infected individual, and indirectly through contaminated objects and surfaces (2). While the exact relative contributions of these routes remains unclear, those who have been in close contact with a COVID-19 case are at highest risk (2).

Reproduction number and transmission dynamics

Estimates for the basic reproductive number (R_0) of early SARS-CoV-2 variants ranged from 2–4 (3). R_0 for confined settings were potentially at the higher end of this range.

Preliminary evidence indicates that the Omicron variant has a transmission advantage over previous variants in highly vaccinated populations likely due to immune escape and increased inherent transmissibility (4, 5).

SARS-CoV-2 variants of concern or interest

The Communicable Diseases Genomics Network (CDGN) actively monitors variants and their reported mutations to understand how they influence the behaviour of the virus.

Some variants are classified as ‘variants of concern’ (VOC), as there is evidence for epidemiological, biological, or immunological features of concern. Some SARS-CoV-2 VOC may be associated with increased transmissibility or higher mortality compared with other lineages (6, 7). Lineages for which there is no clear evidence that the mutations confer epidemiological, pathological or immunological features of concern may be denoted ‘variants under investigation’ or ‘variants of interest’.

For more information see*: PHLN statement on reporting of SARS-CoV-2 variants of concern and interest*.

Incubation period

The median incubation period is 5 to 6 days, with a range of 1 to 14 days (8-10). Around 1% of COVID-19 cases developed symptoms more than 14 days after exposure (11). Some studies

suggest that the incubation period of more recent SARS-CoV-2 variants may be shorter than wild type SARS-CoV-2 (12-14).

There is currently limited evidence to determine how the incubation period for breakthrough infection in vaccinated individuals may differ from infection in unvaccinated individuals.

Infectious period

Several studies have confirmed the occurrence of pre-symptomatic and asymptomatic transmission (15, 16). Pre-symptomatic transmission can occur 1-3 days before symptom onset (17, 18). Peak viral load in upper respiratory tract samples occurs most often around the time of symptom onset and declines after the first week following symptom onset (19).

Clinical presentation and outcome

The most common symptoms of COVID-19 are fever, cough, shortness of breath, sore throat and loss of smell or loss of taste. Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite.

Evidence suggests that the severity of infection with the Omicron variant is less than previous strains. Observational studies indicate that people infected with the Omicron variant are less likely to be hospitalised than patients infected with the previous variants (20).

Case fatality rate

As at 20 March 2022, the crude case fatality rate (CFR) for confirmed cases reported globally is approximately 1.3% (21). The true case fatality rate for COVID-19 is difficult to estimate due to variable case ascertainment, including how this may change over time, especially for mild cases, and the impact of health systems and patient outcomes. Mortality is influenced by individual risk factors, vaccination status, and health care quality and access. As of 20 March 2022, a total of 5,730 COVID-19 deaths have been reported in Australia and 32.7% (1873/5730) of COVID-19 deaths have occurred in residential aged care facility residents who may be at higher risk of severe disease and death (based on aged care public dashboard data and surveillance data).

Persons at increased risk of exposure

People who have frequent, close, or extended contact with others have the potential for greater exposure to SARS-CoV-2.

People at increased risk of exposure include those who:

- Have travelled to areas with higher prevalence of COVID-19;
- Are caring for COVID-19 cases; or
- Come in contact with people with a higher likelihood of having active infection.

Other people at increased risk of exposure might include those in public facing occupations or crowded settings (e.g. hospitality, public transport, retail).

Persons who live or work in a high-risk setting, where there is evidence of a risk for rapid spread and ongoing chains of transmission, may also be at increased risk of exposure if an infectious case is introduced. Settings where disease is likely to readily transmit and be amplified are those with a high population density, settings where people are living or working in close proximity to others, or specific environmental conditions.

People at increased risk of severe disease

Older individuals are at the highest risk of severe COVID-19. Others with certain comorbidities are also at increased risk of severe COVID-19. Information on those at high and moderate risk of severe illness, and other factors that might increase the risk of severe disease, is available on the Department of Health's *Advice for people at risk of coronavirus (COVID-19)*.

4. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and, as much as possible, disease transmission.

As of February 2022, the Australian Technical Advisory Group on Immunisation (ATAGI) recommends vaccination for all individuals aged 5 years and over in a two-dose vaccine schedule (3 doses for severely immunocompromised individuals) for the COVID-19 vaccines currently available in Australia. ATAGI recommends the use of a single booster dose for anyone aged 16 years and older who completed their primary COVID-19 vaccine course 3 or more months ago. For more information, see *Clinical guidance for COVID-19 vaccine providers* and *ATAGI statement on defining up to date status for COVID-19 vaccination*.

The COVID-19 vaccines registered for use in Australia have all been shown to be highly effective against severe disease, including previous SARS-CoV-2 variants of concern (22). There is very strong evidence that COVID-19 vaccination protects against severe disease due to the Omicron variant (23). Existing vaccine safety monitoring systems have been strengthened, with weekly COVID-19 vaccine safety reports provided by the Therapeutic Goods Administration and AusVaxSafety active surveillance system.

Other prevention activities

When combined, prevention and control activities can help limit the spread of certain respiratory diseases, including COVID-19. These measures may include:

1. Physical distancing and gathering
    - Physical distancing can reduce the potential for transmission. Physical distancing measures may include:
        - maintaining a distance of 1.5m from people
        - density restrictions; and
        - limits on the number of people allowed to participate in an event.
2. Environmental controls, such as optimised ventilation
3. Personal hygiene
    - PHUs should encourage good hygiene practices to prevent SARS-CoV-2 infection including:
        - wearing a face mask where physical distancing cannot be maintained, particularly indoors;
        - staying home if unwell;

- effective hand and respiratory hygiene; and
- cleaning surfaces

4. Travel restrictions
    - Some jurisdictions will require quarantine or testing of domestic and international travellers. See *COVID-19 FAQs- international travellers to Australia.*

5. Surveillance

There are five main objectives of surveillance for COVID-19, which are to rapidly:

1. Identify, isolate and manage cases.
2. Identify, quarantine and provide relevant information to contacts.
3. Detect and manage clusters and outbreaks.
4. Characterise the epidemiology of COVID-19 in Australia to inform the public health response including:
    - analysing the progression of the epidemic in time, person and place;
    - describing the transmission dynamics;
    - identifying groups at special risk of infection or more severe disease; and
    - monitoring for SARS-CoV-2 variants.
5. Monitor the effectiveness of the following routine prevention and control activities, in managing the COVID-19 outbreak over time:
    - vaccination;
    - test, trace, isolate and quarantine processes; and
    - public health and social measures.

Reporting

PHUs should immediately notify the central state/territory communicable diseases unit when notified of a confirmed case of COVID-19 or death in an infected person. Jurisdictions can determine reporting requirements for probable cases (e.g. requiring probable cases to self-report positive RAT results).

Where possible, PHUs should collect information regarding the case's age, sex, comorbidities, vaccination status, place of residence, occupation, Indigenous status, any culturally/linguistically diverse background, date of onset, travel history, laboratory results, clinical status and likely place of acquisition.

Central state/territory communicable diseases units will notify confirmed COVID-19 cases and deaths as soon as practicable to the Australian Government Department of Health via both transmission of data to the National Notifiable Diseases Surveillance System (NNDSS) and via email or telephone notification to the National Incident Room.

Data management

PHUs should enter initial information on confirmed cases of COVID-19 onto the jurisdictional notifiable diseases database, for transmission to the NNDSS, within one

working day of the notification/report. Enter enhanced surveillance data shortly after case follow-up. Jurisdictions are encouraged to prioritise and automate as many of these processes as possible, including linking COVID-19 cases to clinical services.

Surveillance of variants of concern

Early identification of cases, where there is a high probability of infection with a VOC such as the Omicron variant, can inform appropriate public health responses. Ideally, these VOC are identified through whole genome sequencing. Omicron primary test results with spike gene target failure may indicate probable infection with this variant. Where possible, public health reference laboratories should confirm the infecting strain using whole genome sequencing, although this may not be possible where large numbers of cases are occurring.

Jurisdictions can refer to the *CDGN Laboratory Case Definitions for SARS-CoV-2 Variants of Concern* for more information.

6. Cases

Definitions

Reporting

Notify confirmed cases in the jurisdiction of public health management. Jurisdictions can determine reporting requirements for probable cases.

People meeting the confirmed or probable case criteria who were previously diagnosed and managed overseas or in another Australian jurisdiction in the past 12 weeks[1] do not need to be re-notified. In this situation, the person should provide documented evidence of diagnosis overseas or interstate to the PHU.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires laboratory definitive evidence.

Laboratory definitive evidence:

1. Detection of SARS-CoV-2 by nucleic amplification acid testing (NAAT);

OR

2. Isolation of SARS-CoV-2 in cell culture, with confirmation using a NAAT;

OR

3. SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Probable case

A probable case includes individuals who have laboratory suggestive evidence

Laboratory suggestive evidence:

Detection of SARS-CoV-2 by rapid antigen testing (RAT)

[1] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

Testing

Specimen collection and testing for SARS-CoV-2

Nucleic acid amplification testing (NAAT) (for example, using reverse transcription polymerase chain reaction (RT-PCR) or transcription-mediated amplification (TMA) is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection.

For advice on selecting a suitable sample for diagnostic NAAT for SARS-CoV-2, specimen handling in the laboratory and different types of SARS-CoV-2 specific testing, see *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Guidance on Personal Protective Equipment (PPE) for specimen collection is available from *ICEG-endorsed infection control guidance*.

Rapid antigen tests

Rapid antigen tests (RATs) are an alternative testing method, providing fast results following the collection of a respiratory sample. The sensitivity of RATs are inherently lower than NAAT and performance of different RATs can vary from test to test.

In the context of widespread community transmission, PHLN and CDNA recommend deployment of RATs to enhance and preserve laboratory-based testing capacity. Specific guidance on the use of RATs is outlined in the *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests.* This statement describes how RATs may be effectively used to enhance Australia's COVID-19 response, while mitigating associated potential limitations and risks.

Guidance implemented may be decided at the discretion of the relevant state or territory in line with the *Testing Framework for COVID-19 in Australia*. The Testing Framework provides guidance on the use and appropriateness of different testing methods within four defined epidemiological zones.

Who to test for SARS-CoV-2

People who have at least one of the following COVID-19 like symptoms should test for SARS-CoV-2:

- Fever (≥37.5 °C) or history of fever (e.g. night sweats, chills); or
- Acute respiratory symptoms (e.g. cough, shortness of breath, sore throat); or
- Loss of smell or loss of taste.

Other non-specific symptoms of COVID-19 include: fatigue, headache, runny nose, acute blocked nose (congestion), muscle pain, joint pain, diarrhoea, nausea/vomiting and loss of appetite.

Testing following a possible vaccine-related adverse event

If a vaccine recipient has not had known contact with a confirmed COVID-19 case and develops fever, headache, fatigue or other mild systemic symptoms within and lasting for less than 48 hours after receipt of a COVID-19 vaccine in the absence of respiratory symptoms (including loss of smell), it is more likely that they have an expected vaccine response and testing may not be required.

If symptoms persist past 48 hours post vaccination, these individuals should get tested. For more information, see *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021*.

Stay at home requirements after COVID-19 testing

Health care workers providing testing services should clearly communicate the following stay at home requirements after COVID-19 testing:

1. Symptomatic people who have tested for SARS-CoV-2 should stay at home until they receive a negative test, regardless of vaccination status.
2. Asymptomatic people who are not close contacts do not need to stay at home whilst awaiting a test result, unless instructed to stay at home by a public health authority.

See Management of Contacts for guidance on quarantine and testing of close contacts.

Assessing indeterminate and suspected false positive NAAT results

Indeterminate (equivocal) or suspected false positive results may occur due to low viral copy numbers; persistent shedding; or non-SARS-CoV-2 target reactivity in the NAAT.

Where feasible (i.e. in settings where laboratories are operating within their capacity), it is recommended that PHUs should contact the laboratory specialist microbiologist (pathologist) to discuss the results and decide whether further testing is required. Consider results in the context of the clinical and epidemiological circumstances to inform whether further laboratory or public health action is required.

For more information on indeterminate results and the possible sources of false positive NAAT results, see *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2*.

Case management

Response times

Confirmed cases:

For timely follow up of cases, PHUs should use automated case management systems that utilise self-managed contact tracing. Where feasible, jurisdictions may complete case interviews, exposure site identification and contact tracing by phone. Phone-based public health follow up would typically be used in situations where case numbers are very low, where new cases have been identified in settings previously without cases (such as remote communities), in some settings with vulnerable cases and contacts, and where SMS or other automated follow up is not practical.

In exceptional circumstances, some PHU staff may be required to contribute to the expert assessment of patients under investigation on hospital clinician or general practitioner request.

Probable cases:

Where feasible, conduct follow up of probable cases as per confirmed cases (see above).

Response procedure

Genomic sequencing

Genomic sequencing is an important part of SARS-CoV-2 surveillance and can be used to monitor transmission dynamics, identify lineages of concern, and inform outbreak investigation and public health response.

Where community transmission is established, it may not be justifiable to attempt to sequence every COVID-19 case. In these situations, PHUs should employ prioritisation strategies based on their jurisdiction's epidemiological context, capacity and priorities. This approach balances the costs and benefits of real-time SARS-CoV-2 genomic surveillance, where there is rapid spread of a dominant variant.

The *CDGN, PHLN and CDNA Sampling strategy for SARS-CoV-2 genomic surveillance* provides guiding principles and outlines an approach to selective and targeted sequencing. This includes guidance on priority groups for targeted sampling (e.g. international travellers).

For further information, see:

- *PHLN guidance on laboratory testing for SARS-CoV-2*
- *Testing Framework for COVID-19 in Australia*
- *Australian National Disease Surveillance Plan for COVID-19*

Case investigation

Where feasible, PHUs should respond to COVID-19 case notifications as soon as possible via a case interview. However, where public health capacity is exceeded, PHUs can automate and prioritise case investigation processes (e.g. SMS based questionnaires). This may include automated surveys to collect only essential information that will assist with risk stratification, prioritisation of cases for public health follow up and surveillance. Priority cases include people in high-risk settings or situations.

If automated case management systems are utilised, PHUs should direct cases to self-isolate and provide them with information on how to isolate from others in their residence and what supports are available. PHUs should also provide information detailing how to conduct case-initiated contact management and how to access medical care.

Clinical management

In the absence of pathogen-specific interventions, patient management largely depends on supportive treatment, and vigilance for and treatment of complications. For further advice on clinical management, see:

- *WHO*
- *National COVID-19 Clinical Evidence Taskforce*
- *Cochrane Library: Coronavirus (COVID-19)*

Prophylaxis against severe disease:

Proactive use of monoclonal antibody therapy in people at high risk of developing severe disease may help prevent hospitalisation if it is administered within the first five days of developing symptoms. PHUs, in conjunction with the local clinical team, can help identify

cases for clinical treatment early. For further information on emerging clinical treatments, see *National COVID-19 Clinical Evidence Taskforce*.

Education

PHUs should provide access to educational resources about the nature of the illness, importance of isolation and infection control measures that prevent the transmission of COVID-19. PHU staff should make accessible a COVID-19 factsheet to cases and their household contacts.

Hospitalised COVID-19 patients

To minimise the risk of transmission from hospitalised COVID-19 patients, PHUs should encourage hospitals to undertake a system based risk assessment. Hospitals can manage risk by applying layered mitigations using the hierarchy of controls. This includes using a combination of:

- Elimination controls to reduce opportunities for staff exposure and transmission of the virus (e.g. reducing entry to patient rooms, excluding staff who are unwell and vaccinating staff).
- Engineering controls (e.g. optimising ventilation and using negative pressure rooms, where available).
- Administrative controls (e.g. through implementation of effective infection prevention and control policies and protocols).
- Appropriate use of PPE.

Hospitalised confirmed or probable cases should isolate in a negative pressure room with anteroom, where available. If a negative pressure room is not available, the hospitalised case can isolate in a standard isolation room or single room with negative airflow as an alternative. Avoid rooms with positive pressure airflow.

If there is concern about a potential exposure related to a hospitalised case, PHUs should assist with providing resources to support risk assessment of hospital staff, visitors or other patients to determine whether further public health response is required (See Health and residential care workers).

For further guidance on infection prevention and control, including PPE, see ICEG-endorsed infection control guidance.

Release from isolation

Release from isolation criteria for all confirmed or probable cases

The following table details release from isolation criteria for all confirmed or probable cases as outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

To calculate the isolation period, day 0 is the day the case took their first positive test. Day 1 is the first full day after the first positive test was taken.

Summary of release from isolation criteria agreed by National Cabinet[3]	
Asymptomatic case	If they remain asymptomatic after 7 days have passed since their first positive test, the case can be released from isolation.
Symptomatic case	If acute respiratory symptoms[4] resolve after 7 days since their first positive test, the case can be released from isolation. If acute respiratory symptoms are not resolved after 7 days since their first positive test, the case should remain isolated until their acute symptoms have resolved.

In addition to the above criteria, in some high-risk clinical settings, confirmed cases who are significantly immunocompromised[5] may be requested to meet the below additional criteria:

- Negative NAAT on at least two consecutive respiratory specimens collected at least 24 hours apart, after 7 days have passed since the first positive test; OR
- Negative RAT on at least two consecutive respiratory specimens collected at least 24 hours apart, after 14 days have passed since the since the first positive test.

[3] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

[4] Some people may have pre-existing illnesses with chronic respiratory signs or symptoms, such as chronic cough. Others may have on-going sequelae that result in symptoms such as continuing shortness of breath or post viral cough. For these people, the treating medical practitioner can make an assessment as to whether the respiratory signs and symptoms of acute COVID-19 have resolved.

[5] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who: have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm^3; are receiving dialysis; or other conditions specifically noted by the treating medical practitioner.

Testing after release from isolation

Recovered cases do not need to be retested within 12 weeks[6] after release from isolation, regardless of symptoms.

If 12 weeks have passed after release from isolation, recovered cases should be tested for SARS-CoV-2 if they develop new COVID-19 symptoms and managed as a close contact if they meet the close contact definition.

Release from isolation and high-risk settings

Cases returning to a high-risk setting can be released from isolation based on the above criteria and do not need to meet a higher standard/ additional assessment before going into any high-risk settings. This includes persons returning to work in a health care setting, living in a residential aged care facility, or who regularly attend health care settings for any other reason. Specifically, if a person has met RFI criteria, it is not necessary for them to:

- undergo isolation or quarantine in another ward, the facility they are returning to, or any other location, or
- have evidence of any negative test results for SARS-CoV-2 prior to returning to residential aged care or any other setting.

However, there is some laboratory based evidence that a small proportion of people with a previous SARS-CoV-2 variant infection may still be infectious despite fulfilling RFI criteria.

Hospitalised patients who are being transferred to another ward or hospital should remain in isolation with transmission-based precautions and appropriate PPE until release from isolation criteria are met. People who have recovered from COVID-19 and have been released from isolation based on the criteria above do not require COVID-19 testing if they are hospitalised for a non COVID-19 related condition.

As a precaution, all recovered cases should continue following community recommendations (e.g. physical distancing, hand hygiene, masks where indicated, etc.) and health care workers should continue to use appropriate PPE as recommended when caring for COVID-19 patients, or in settings of potential exposure. Infectious cases living in the same household as recovered cases should remain isolated from recovered cases to the extent practicable.

[6] This time period has been recommended for pragmatic reasons. CDNA will review this recommendation as more evidence becomes available.

7. Contacts

Close contact definition

The aim of contact tracing is to interrupt transmission of SARS-CoV-2 through identification and quarantining of people in contact with infectious cases. PHUs can use the below close contact criteria to identify and prioritise people who have been exposed and potentially incubating the disease.

The following definitions have been adapted from the definition outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous definitions have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

Contact classification[7]	Type of contact made during the case's infectious period
Close contact	A person who resides with or stays overnight in the same premises or has had more than 4 hours of cumulative contact with a COVID-19 case in a residential setting[8]. In exceptional circumstances or where a significant transmission event has occurred, PHUs may consider classifying additional persons as close contacts.
Other contact	A person who has been exposed to a COVID-19 case but does not meet the definition of a close contact.

Some jurisdictions have developed risk matrices for classification of close contacts in certain settings (e.g. for schools, workplaces). The rationale for risk assessment guidance is to balance COVID-19 transmission risk with the risk of furloughing staff to the extent that the business becomes non-operational. Such guidance will take account of specific risk mitigations within the operation of the business.

Note that:

- For contact tracing, the infectious period is considered to be the period extending from 48 hours before onset of symptoms in the case until the case is classified as no longer infectious (refer to Release from isolation).

[7] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

[8] A residential setting is a building or a part of a building where individuals: spend the night for sleeping; including a house, apartment, or other private dwelling, and share facilities for acts of daily living which have the potential to create exposure between co- residents.

Residential settings may include: aged care facilities, military residential settings, boarding schools, boarding houses, homeless shelters, and maritime vessels

- If the case is asymptomatic, the infectious period is the period extending from 48 hours before the initial positive test until the case is classified as no longer infections (refer to Release from isolation).
- For guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by risk, see Health and residential care workers.

Management of contacts

Jurisdictions may devolve contact management practices to other methods such as automated identification and management of contacts. Jurisdictions may also provide public information to support self-managed contact tracing, testing and quarantine. PHUs may direct cases to follow up their own contacts and tell them to follow relevant public health advice.

Quarantine and testing of close contacts

Close contacts who have recovered from COVID-19 do not need to quarantine if:

- they remain asymptomatic;
- they are not immunocompromised; and
- re-exposure is less than 12 weeks since release from isolation (see Testing after release from isolation).

The following table has adapted the quarantine and testing requirements outlined in the *National Cabinet agreed COVID-19 Test & Isolate National Protocols*.

Revisions have been made to quarantine and testing requirements for pragmatic reasons in response to a context of high case prevalence and the significant impacts previous requirements have had on Australian communities, laboratory testing capacity and the public health workforce. CDNA notes the viral characteristics of SARS-CoV-2 have not changed.

To calculate the quarantine period, day 0 is considered the date that the first positive sample was collected from the primary case. Day 1 is the first full day after the primary case's positive test was taken.

Regardless of whether any new cases are identified in the household, all household close contacts will undertake a static 7-day quarantine period, with day 0 being the date that a positive sample was collected from the primary case, or for household-like contacts, the date of last exposure to the COVID-19 case.

Contact classification	Testing recommendations and quarantine requirements[9] (regardless of vaccination status)
Close contact	**Testing recommendations** • RAT/NAAT if symptoms develop • RAT on day 1 of quarantine • RAT on day 6 or 7 of quarantine

[9] Some jurisdictions have not adopted the National Cabinet agreed COVID-19 Test and Isolate National Protocols. PHUs in these jurisdictions should refer to their state or territory health department guidance.

	Quarantine requirements
	• Quarantine for 7 days after the day the primary case took their first positive test (or date of last exposure to the primary case for household-like contacts) and monitor for COVID-19 symptoms.
	• If the day 6 or 7 RAT is negative and the close contact has no symptoms, they can exit quarantine at day 7.
	• If a close contact has symptoms and they return a negative RAT, the close contact should get a NAAT as soon as possible. If it is not feasible to get a NAAT, the close contact should get a second RAT 24 hours later.
	• If a positive RAT or NAAT is returned at any time during quarantine, the close contact should isolate until they meet the release from isolation criteria.
	Other recommendations
	• In the 7 days after exiting quarantine:
	  ○ Wear a mask when outside home.
	  ○ Monitor for COVID-19 symptoms. If the close contact becomes symptomatic, the close contact should isolate and be tested (RAT or NAAT).
	  ○ Where applicable, follow the requirements and guidance of high-risk settings.

Other contact	**Quarantine requirements** • No quarantine is required. **Other recommendations** • Monitor for symptoms for 14 days following exposure to a COVID-19 case. Where feasible, get a RAT/NAAT if symptoms develop. • If a positive RAT or NAAT is returned at any time within the 14 days following exposure to a COVID-19 case, the close contact should isolate until they meet the release from isolation criteria.

Health care and essential workers

For guidance on work permissions and restrictions for essential workers, PHUs can refer to the *National Cabinet's Interim Guidance on Permissions and Restrictions for Essential Workers*. This essential workers interim guidance outlines a process to support decision making when determining whether to place work permissions/restrictions on an essential worker who is subject to isolation or quarantine. This guidance presents a pragmatic approach to reduce the impact on workforce availability caused by increased case numbers and transmissibility of the Omicron variant.

The interim guidance has been developed by National Cabinet, taking into consideration the current context of the pandemic, including significant vaccination coverage in Australia, the commencement of booster vaccination, the emergence of Omicron, and likely future

progression. The interim guidance aims to allow for greater flexibility in balancing the need to reduce transmission against workforce shortages and consequent impacts on essential services.

For guidance on health care specific settings, PHUs can refer to *Permissions and Restrictions for Workers in Health Care Settings – Interim Guidance* for guidance on individual risk assessment of workers in health care settings, including recommended work permissions and restrictions as determined by exposure risk.

Medical care for quarantined individuals

PHUs should advise close contacts that if they require medical attention for any reason (e.g. fever and respiratory symptoms or other illness/injury), they should telephone their GP or hospital Emergency Department and advise them of their close contact status before presenting. Close contacts with severe symptoms should call 000 and clearly communicate to the emergency services operator that they are a close contact. Close contacts should wear a mask before presenting to any health care setting.

Education

Close contacts should be counselled about their risk and the symptoms of COVID-19 and provided with a COVID-19 factsheet. They should be given advice about the need to immediately self-isolate and get tested should they develop symptoms and given information about where and how to access COVID-19 testing.

8. High-risk settings

Residential care facilities

Outbreaks of COVID-19 in residential care facilities should be managed with close reference to the *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.* These guidelines provide specific advice on the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia.

Outbreaks of COVID-19 in congregate disability accommodation settings should also be managed with reference to the *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement*. These guidelines add tailored advice to support disability residential service providers and public health authorities to respond to the risk and occurrences of COVID-10 outbreaks in these settings.

Aboriginal and Torres Strait Islander Communities

CDNA will continue to monitor the emerging evidence around COVID-19 transmission risks in Aboriginal and Torres Strait Islander communities and revise these recommendations as needed. For further information, refer to the *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* and *CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19*.

Correctional and detention facilities

Correctional and detention facilities may have existing frameworks and protocols in place for testing and isolation in the event of a communicable disease outbreak. Correctional and detention facilities should prepare for and manage outbreaks of COVID-19 with close reference to the CDNA *national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia*.

Meat processing facilities

Meat (including poultry) processing facilities may present a higher risk of COVID-19 transmission to workers. These workplaces are vulnerable for a number of reasons including: production line work in close proximity to others; limited hygiene measures due to tally driven work; temperature and humidity; and employer sponsored communal housing and transport.

PHUs may assist work health and safety representatives to implement measures aimed at mitigating risk of COVID-19 exposure. Further information on COVID-19 in these facilities is available in Work Safe Victoria's recommendations for *Managing the risk of COVID-19 exposure: meat and poultry processing*. PHUs may also refer to the US Centers for Disease Control's *Facility Assessment Tool for Meat and Poultry Processing Facilities* to conduct an assessment of infection prevention and control measures within the facility.

9. Special situations

Use of COVID-19 vaccination in outbreak situations

Targeted vaccination of defined populations who may be at risk of exposure is an important activity complementing existing public health interventions. Targeted vaccination may increase the proportion of people who have received one dose, are fully vaccinated, or have received a booster dose of a COVID-19 vaccination (where eligible).

In an outbreak, PHUs can use COVID-19 vaccination to:

1. Reduce the number and severity of COVID-19 cases in an outbreak, where there is likely to be an ongoing risk of exposure.
2. Opportunistically increase vaccination uptake in the population through timely messaging around the benefits of vaccination.

Key considerations about using COVID-19 vaccines during outbreaks include: the location, target population, context of the outbreak, local epidemiology of COVID-19, and timing of potential exposure.

Vaccination as an outbreak response tool is of greatest use in geographic areas or populations with low vaccination coverage. However, public communications should emphasise the importance of people getting vaccinated even in areas of high coverage.

PHUs can also use COVID-19 vaccination in closed settings where there is an ongoing risk of exposure due to multiple chains of transmission. Example settings include residential aged care facilities, correctional facilities, remote industrial sites (e.g. mining camps) or educational institutions.

In these contexts, vaccination may provide both direct protection against severe illness and death, and indirect protection by limiting outbreak size and duration.

Where possible, PHUs should evaluate the effectiveness of vaccination campaigns in limiting the impacts of COVID-19 at the conclusion of the outbreak.

Schools

Schools and Early Childhood Education and Care (ECEC) facilities may implement a variety of strategies to reduce COVID-19 transmission, including:

- Cohorting and staggering class schedules
- Use of RAT (either for symptomatic people or routine screening)
- Mask wearing at relevant ages
- Improvement in ventilation/teaching in outdoor settings where feasible
- Optional hybrid or remote learning

Schools and ECEC facilities are responsible for implementing risk mitigation strategies and outbreak response plans in line with jurisdictional guidance.

Jurisdictions have developed operational plans for schools, taking into consideration the objectives and guiding principles of the *National Framework for Managing COVID-19 in Schools and Early Childhood Education and Care (ECEC)*. Key objectives outlined in this framework include protection of vulnerable students and staff at higher risk of severe

disease, minimising disruption to face-to-face learning, minimising transmission and minimising broader workforce disruptions for parents and carers.

Jurisdictions may also recommend additional measures for boarding schools due to increased transmission risk and consequences associated with infection. This may involve requiring boarding schools to have clear isolation/quarantine plans in place and clear messaging to parents and carers about the risks associated with boarding.

International travellers

For information on international travel, pre-flight testing and travel requirements, see *International travel and COVID-19* and *Coronavirus (COVID-19) FAQs – international travellers to Australia*.

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11. Appendix A: Full revision history

Version	Date	Revised by	Changes
6.7	22 March 2022	Communicable Diseases Network Australia	Updated: Release from isolation, Management of contacts
6.6	02 March 2022	Communicable Diseases Network Australia	Updated: Reinfection definition, Release from isolation criteria, Management of contacts
6.5	21 February 2022	Communicable Diseases Network Australia	Updated: Key definitions, The Disease, Routine prevention activities, Testing, Management of contacts, Special situations, Appendices
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations

Version	Date	Revised by	Changes
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death

Version	Date	Revised by	Changes
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.

Version	Date	Revised by	Changes
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 7.0

3 June 2022

Summary of revision history

Please note this table is a summary of key revisions to this guidance. For full revision history, refer to *Appendix D*.

Version	Date	Revised by	Changes
Version 7.0	3 June 2022	CDNA	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history.
Version 6.0	08 November 2021	CDNA	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response
Version 5.0	06 October 2021	CDNA	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
Version 4.0	23 December 2020	CDNA	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
Version 3.0	28 May 2020	CDNA	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
Version 2.0	13 March 2020	CDNA	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
Version 1.0	23 January 2020	CDNA	Developed by the 2019-nCoV Working Group.

Disclaimer

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). The intention of these guidelines is to reflect the current evidence base, with pragmatic guidance provided where evidence is still evolving. Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Additional resources are available as appendices to support this guideline.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

CONTENTS

1. Summary

Public health priority

An automated electronic survey should be delivered to cases within 24 hours of notification to allow accurate reporting of cases and prioritisation for public health follow up.

Priority Classification	Public health response timeline
Urgent	Where there is concern for a new Variant of Concern, act as soon as possible – respond within 24 hours
High	Outbreaks in *high-risk settings*, act as soon as possible – respond within one working day
Routine	Individual cases in most community settings do not require individual follow up

Routine prevention activities

In the context of widespread community transmission, it is essential to implement *routine prevention activities* to minimise transmission of SARS-CoV-2.

Case management

Confirmed cases must isolate until they meet the appropriate *release from isolation criteria*.

Contact management

Contact management for COVID-19 is dependent on epidemiological context and jurisdictional guidance. In the context of widespread community transmission, contact tracing and management should be prioritised for high-risk settings. For the general population, other public health measures can be utilised. Please see *management of contacts* for further guidance.

2. The disease

Infectious agent

SARS-CoV-2 is the infectious agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 is the ninth coronavirus documented to affect humans, with all previous human coronaviruses having strong evidence of zoonotic origins (1). The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests zoonotic origins of SARS-CoV-2 are likely, with bats the possible source. However, the route of initial transmission to humans remains unclear and further investigation is required (2).

Disease occurrence and public health significance

The first cases of "pneumonia with unknown cause" detected in Wuhan, China, were notified to The World Health Organization (WHO) on 31 December 2019 (3). The cause was identified as a novel coronavirus and WHO declared the outbreak a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (4). WHO subsequently declared a pandemic on 12 March 2020 (5). Australia's first case of locally acquired COVID-19 was reported on 2 March 2020 (6). By 31 December 2021, two years since the first case was notified, the global excess mortality attributed to COVID-19 was estimated to be 18.2 million, well above the reported number of deaths of 5.94 million (7).

Variants of Concern and Interest

Like other viruses, SARS-CoV-2 evolves over time, often with minimal impact on its properties. Some mutations, however, affect the properties in a way that pose an increased risk to public health. The WHO Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE) monitors for such variants to determine if they meet the definition of a Variant of Interest (VOI) or a Variant of Concern (VOC).

The Communicable Diseases Genomics Network (CDGN) monitors VOCs in Australia. If the characteristics of emerging VOCs affect the properties of the virus in a way that significantly impacts Australia's public health, the guidance provided in this document may need to be adjusted.

A summary of current VOCs can be found in *Appendix A*. This includes information on the following key characteristics:

- reproduction number and transmission dynamics
- incubation period
- infectious period
- clinical presentation and outcome.

Mode of transmission

SARS-CoV-2 is primarily transmitted by exposure to infectious respiratory droplets and particles. Exposure occurs primarily through three routes (8):

- Inhalation of respiratory droplets and aerosolised particles.
- Deposits of respiratory droplets and particles on mucous membranes (mouth, nose, eyes).

- Touching of mucous membranes with hands directly contaminated with virus-containing respiratory fluids or indirectly by touching surfaces contaminated with virus-containing respiratory fluids.

Incubation period

The median incubation period of ancestral strains of SARS-CoV-2 is 5 to 6 days, with a range of 1 to 14 days (9-11). Studies have shown shorter incubation periods for both Delta and Omicron VOCs than ancestral SARS-CoV-2 (12-15). Please see *Appendix A* for further information on the characteristics of current VOCs.

Infectious period

Secondary transmission of SARS-CoV-2 can occur in pre-symptomatic and asymptomatic people and can continue as long as they shed whole live viruses (16-18). *Nucleic acid amplification testing (NAAT)* is not an effective measure of infectiousness as it can detect viral fragments that do not correlate with infectiousness. Studies have instead used viral cultures to estimate the duration of infectiousness for SARS-CoV-2. For the ancestral strains of SARS-CoV-2, people with mild-to-moderate illness were highly unlikely to be infectious more than 10 days after symptom onset (19). The infectious period, however, can vary based on individual factors and the VOC (see *Appendix A* for current VOC). Individuals with severe disease, or who are significantly immunocompromised may have prolonged infectious periods (20).

The infectious period for COVID-19 is generally taken from 48 hours prior to symptom onset (or positive test if asymptomatic) until release from isolation. The *isolation period* is covered later in this document.

Clinical presentation and outcome

COVID-19 usually presents with symptoms similar to other *acute respiratory infections (ARI).*

Less commonly, SARS-CoV-2 can cause more severe disease including pneumonia, acute respiratory distress syndrome (ARDS), complications affecting other organ systems, and long-term sequelae (e.g. post COVID-19 condition).

In January 2022, two years after Australia's first COVID-19 case, Australia's reported case fatality ratio (CFR) was less than 0.2%, with approximately one third of Australia's deaths occurring in residential aged care facility residents (21). This is in comparison to a global CFR of approximately 1.2% (22).

For current information on COVID-19 case outcomes, please see *Coronavirus (COVID-19) case numbers and statistics | Australian Government Department of Health*

Evidence indicates that the severity of COVID-19 differs depending on the VOC, please see *Appendix A* for further information on current VOCs.

Groups at high risk of severe disease

Increasing **age** is the most important risk factor for severe disease, with risk significantly increasing around 60-70 years of age.

Unvaccinated or partially vaccinated people are at greater risk of severe disease.

Risk of severe disease also increases with:

- the number, severity and nature of comorbidities
- immunosuppression
- disability and frailty
- Aboriginal and Torres Strait Islander status
- pregnancy.

Further information is available on the Department of Health's website: *Risk factors for more serious illness*

High-risk settings and communities

In the context of widespread community transmission, high-risk settings are generally settings where there is both a:

- high proportion of people at high-risk of severe disease (for example, due to age or chronic medical conditions)
- higher risk of transmission due to close proximity and difficulty instituting control measures such as physical distancing or environmental controls.

In the context of widespread community transmission, jurisdictions routinely define the following settings as high-risk:

- Healthcare settings.
- Residential care facilities.
- Correctional and detention facilities.

Jurisdictions may define additional settings as high-risk based on their epidemiological context.

There are specific guidelines and risk matrices available for the management of COVID-19 in certain high-risk settings and communities. For a list of these guidelines, please see *Appendix B*.

3. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and where possible, disease transmission.

For current Australian Technical Advisory Group on Immunisation (ATAGI) recommendations and the latest evidence for COVID-19 vaccines, please see *Clinical guidance for COVID-19 vaccine providers* and *ATAGI statement on defining up to date status for COVID-19 vaccination*.

For the latest information about Australia's COVID-19 vaccine rollout, please see *About Australia's COVID-19 vaccine rollout | Australian Government Department of Health.*

Recommendations to stay at home for people with acute respiratory symptoms

People with symptoms consistent with an acute respiratory infection (ARI) should **stay at home when sick** to help prevent the spread of all respiratory viruses, including SARS-CoV-2 (23, 24).

Except for medical care or other urgent reasons, people with acute respiratory symptoms should stay at home until:

- at least 24 hours has elapsed since their last fever episode (without the use of fever-reducing medications)
- there is significant improvement in their acute respiratory symptoms

People with acute respiratory symptoms should also undergo *testing* for SARS-CoV-2 and possibly other respiratory pathogens (e.g. multiplex PCR). If they receive a positive SARS-CoV-2 result they need to follow *isolation and restriction guidance* for COVID-19.

Symptoms of acute respiratory infection

An acute respiratory infection (ARI) is defined as a recent onset of new or worsening acute respiratory symptoms: cough, breathing difficulty, sore throat, or runny nose/nasal congestion with or without other symptoms (see below).

Other symptoms may include:

- headache, muscle aches (myalgia), fatigue, nausea or vomiting and diarrhoea. Loss of smell and taste and loss of appetite can also occur with COVID-19, but may be less common with new variants of the disease
- fever (≥37.5°C) can occur, however is less common in elderly individuals
- in the elderly, other symptoms to consider are new onset or increase in confusion, change in baseline behaviour, falling, or exacerbation of underlying chronic illness (e.g. increasing shortness of breath in someone with congestive heart failure).

Universal prevention activities

In the context of widespread community transmission, it is important for everyone to implement prevention activities to minimise transmission of SARS-CoV-2 and other respiratory infections. Evidence has demonstrated that public health measures are simple and effective in reducing SARS-CoV-2 transmission (25). The following measures should be applied at the individual, community and organisational level. Refer to jurisdictional guidelines for any additional requirements.

Universal prevention activities to minimise SARS-CoV-2 transmission[1]

Prevention type	Universal Prevention Activities	When Recommended
Respiratory virus protective measures	An effective public health measure to reduce the spread of all respiratory viruses is for people with acute respiratory symptoms to follow *recommendations to stay at home (23, 24)*.	Always
Personal hygiene	Irrespective of symptoms individuals should follow sound personal hygiene practices to prevent infection and transmission (25), including: • effective hand and respiratory hygiene • cleaning surfaces with viricidal products.	Always
Physical distancing and gathering	Physical distancing is associated with a reduction in infections (26). This benefit is likely to increase with increased physical distance. Physical distancing measures may include: • individuals to maintain a minimum distance from people of 1.5m • density restrictions in line with jurisdictional guidance.	Wherever feasible
Environmental controls	Improving indoor air quality (optimised ventilation) can reduce- transmission (27, 28).	Wherever feasible
Personal Protective Measures	To add an additional layer of protection and lower the risk of infection or transmission individuals may consider using PPE (e.g. wearing a face mask (29, 30).	When people with symptoms need to leave home for urgent reasons or medical care When indoors, or where physical distancing cannot be maintained outdoors

The above activities can be applied in line with the hierarchy of controls for preventing transmission of SARS-CoV-2. The hierarchy lists different risk mitigation and avoidance strategies including elimination, substitution, engineering controls, administrative controls and PPE. These are further outlined in the ICEG guidance *minimising the risk of infectious respiratory disease transmission in the context of COVID-19: the hierarchy of controls.*

[1] Jurisdictions may mandate certain prevention activities based on their epidemiological context. Please refer to jurisdictional guidance.

4. Surveillance

Surveillance objectives

The COVID-19 surveillance objectives are aligned with the epidemiological context of the pandemic. With widespread community transmission, the key public health surveillance objectives are to:

- Record, monitor and report number of cases and geographical distribution.
- Prioritise and manage clusters and outbreaks in high-risk settings and communities.
- Monitor the burden of disease including health care system impacts and excess mortality.
- Monitor SARS-CoV-2 variants through whole genome sequencing - to detect VOCs, to inform vaccine development and efficacy, and to inform public health action.
- Monitor the effectiveness of prevention and control activities.

Jurisdictions may have additional surveillance objectives. Please refer to jurisdictional guidance.

Reporting

With widespread community transmission of SARS-CoV-2, reporting priorities to central state/territory communicable diseases units should include:

- laboratory notification of positive SARS-CoV-2 NAAT results
- timely self-reporting of positive RAT results
- collection of case demographics and *risk factors for severe disease* through automated electronic surveys
- notification of clusters and outbreaks in high-risk settings and communities
- notification of COVID-19 cases in hospital and intensive care
- notification of COVID-19 related deaths.

Central state/territory communicable diseases units will provide data to the Australian Government Department of Health through the National Notifiable Diseases Surveillance System (NNDSS).

COVID-19 surveillance guidance

COVID-19 Surveillance Plan

The *Australian National Disease Surveillance Plan for COVID-19* (COVID-19 Surveillance Plan) describes Australia's national disease surveillance approach and outlines national surveillance goals, objectives and indicators.

Testing Framework

The *Testing Framework for COVID-19 in Australia* (COVID-19 Testing Framework) provides guidance on the use and appropriateness of different testing methods based on the epidemiological context and priority testing groups. The COVID-19 Testing Framework also provides information on minimum considerations for workplace surveillance and technical guidance for current and emerging SARS-CoV-2 testing technology and methods, including whole genome sequencing and wastewater surveillance.

Sampling strategy for SARS-CoV-2 genomic surveillance

The Communicable Diseases Genomics Network has developed the *Sampling strategy for SARS-CoV-2 genomic surveillance*. This strategy outlines an approach for genomic surveillance from comprehensive sequencing to selective and targeted sequencing in the context of widespread community transmission. For additional guidance please see *Appendix B*.

5. Testing

Public Health Units (PHUs) should follow jurisdictional testing guidance in line with the *COVID-19 Testing Framework*.

Primary testing methods

Details on the different testing methodologies for SARS-CoV-2 can be found at *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Nucleic acid amplification testing

Nucleic acid amplification testing (NAAT), e.g. reverse transcription polymerase chain reaction (RT-PCR), is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection. As NAAT is laboratory-based, capacity may be overwhelmed with high levels of community transmission.

Rapid antigen tests

Rapid antigen tests (RATs) are an alternative testing method that can be self-administered and provide fast results following the collection of a respiratory sample. RAT sensitivity is inherently lower than NAAT. Performance of different RATs can vary from test to test and depend on the VOC and the prevalence of infection in the community.

Testing recommendations

Anyone with COVID-19 compatible symptoms should continue to be tested for SARS-CoV-2.

In the context of **widespread community transmission**:

- NAAT should be prioritised to ensure availability for:
  - People who need to be considered for treatment, including those:
    - *at high-risk of severe disease*
  - People who require hospital level care for their symptoms.
    - People in circumstances when additional control measures may be required:
    - for those at risk of exposing people at high-risk of severe disease including those who live or work in a *high-risk setting*
    - when there is concern regarding a new VOC.
- RATs may be used for other symptomatic people when NAAT is unavailable or there is need to relieve pressure on laboratory systems

A positive RAT result will not require a confirmatory NAAT and should be treated as a probable case. Anyone with a positive RAT should register this result as directed by the jurisdictional public health order/direction.

6. Cases

Definitions

Reporting

Notify confirmed and probable cases. Refer to jurisdictional guidance for specific notification requirements.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires *laboratory definitive evidence*.

Laboratory definitive evidence:

- Detection of SARS-CoV-2 by nucleic amplification acid testing (NAAT); or
- Isolation of SARS-CoV-2 in cell culture, with confirmation using a NAAT; or
- SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Probable case

A probable case includes individuals who have *laboratory suggestive evidence*

Laboratory suggestive evidence:

- Detection of SARS-CoV-2 by rapid antigen testing (RAT)

Reinfection

Reinfection is a subsequent confirmed SARS-CoV-2 infection in a person with a recent known history of confirmed or probable COVID-19 that is determined to be separate to the previous infection based on epidemiological and/or laboratory findings.

Automated surveillance systems will not routinely count positive results within 12 weeks of an individual being released from isolation. Positive results within this time period will need to be followed up by the individual's usual medical practitioner. See *re-exposure and reinfection following recovery from COVID-19* for further information. PHUs should follow jurisdictional advice.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed or probable COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

Case management

Response times

Automated electronic survey should be delivered to cases within 24 hours of notification to allow accurate reporting of cases and prioritisation for public health follow up. Refer to jurisdictional guidelines for specific requirements.

Priority Classification	Public health response timeline
Urgent	Where there is concern for a new Variant of Concern, act as soon as possible – respond within 24 hours
High	Outbreaks in *high-risk settings*, act as soon as possible – respond within one working day
Routine	Individual cases in most community settings do not require individual follow up

Case investigation

An automated case management system should prioritise cases to allow targeted follow up where appropriate, particularly in high-risk settings.

Where automated case management systems are utilised, jurisdictions should ensure cases are provided with accessible and up to date information on how to manage their illness, access medical care, and understand their isolation requirements.

In addition to automated case management systems, jurisdictions may also consider a random or targeted selection of case interviews. This can help monitor for changes in disease epidemiology and assist in modelling projections of future COVID-19 case counts.

Clinical management

The *National COVID-19 Clinical Evidence Taskforce* provides up to date clinical guidance for COVID-19 cases, including supportive therapy and prophylactic treatments against severe disease. Public health responses are not routinely involved in individual clinical management. During the course of public health response, cases identified at high-risk of severe disease may be linked with appropriate clinical services.

Isolation and restriction guidance

Isolation of COVID-19 cases is effective in reducing the spread of disease. The ideal duration of isolation should be determined based on the infectious period of the current VOC (see *Appendix A*). A minimum standard for release from isolation is outlined below.

Minimum release from isolation criteria for COVID-19 cases

This minimum standard aims to balance this risk with the impact of prolonged isolation on individuals and communities. A small proportion of cases may still be infectious when released from isolation based on these criteria.

Cases can be released from isolation 7 days after their first positive test if they meet the following criteria:

- **Substantial resolution of their acute respiratory symptoms**
- **No fever for 24 hours without the use of fever reducing medications**

Cases who do not meet the above criteria after 7 days should remain isolated until these criteria are met.

Additional requirements for high-risk settings

High-risk settings should consider additional requirements due to the impact transmission can have in these settings. These may include

- Patient/resident deisolation guidance and procedures
- Staff return to work guidance
- Guidance for visitors attending high-risk settings

Guidance should be tailored to the level of risk for each setting type or, where required, tailored to the individual (e.g. severely unwell hospital inpatients). Guidance may include longer isolation periods, additional testing requirements, and individual assessment for significantly immunocompromised people[3].

Please refer to jurisdictional guidance and additional resources in *Appendix B*.

Re-exposure and reinfection following recovery from COVID-19

Natural infection with SARS-CoV-2 provides some protection against reinfection; however, reinfection is possible. The level of protection provided by natural infection is not fully known

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who: have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm3; are receiving dialysis; or other conditions specifically noted by the treating medical practitioner. ATAGI presents their definition for significantly immunocompromised in their *recommendations on the use of a third primary dose of COVID-19 vaccine in individuals who are severely immunocompromised.*

but is likely to decrease over time and depends on the VOC. For information on current VOCs, please see *Appendix A*.

Emerging evidence on reinfection is being closely monitored and may require review of the following guidance.

Re-exposure within 12 weeks of release from isolation

If a person meets the close contact definition within 12 weeks of release from isolation and is **asymptomatic,** they do not need to follow close contact requirements or undergo SARS-CoV-2 testing for screening purposes. If they become **symptomatic,** they should follow the guidance below for *all people who develop new symptoms within 12 weeks of release from isolation*.

Guidance for all people who develop new symptoms within 12 weeks of release from isolation

To reduce the transmission of all respiratory viruses, including SARS-CoV-2, all people who develop new acute respiratory symptoms within 12 weeks of release from isolation should follow *recommendations to stay at home for people with acute respiratory symptoms*. This is irrespective of whether they have a known re-exposure or not.

While the risk of reinfection appears low for several weeks following recovery from COVID-19, reinfection is possible during this time (31-33). The risk of reinfection is generally higher in people who are significantly immunocompromised (32, 34, 35).

People who have recovered from COVID-19 and develop new acute respiratory symptoms should be tested for SARS-CoV-2 where a diagnosis will usefully inform their clinical management. This clinical guidance is irrespective of time since release from isolation.

People who test positive for SARS-CoV-2 within 12 weeks of release from isolation should follow *isolation and restriction guidance* and be followed-up by their usual medical practitioner to determine if they require treatment (i.e. reinfection or recrudescence).

Guidance for recovered cases greater than 12 weeks of release from isolation

If 12 weeks have passed after release from isolation, recovered cases should be:

- tested for SARS-CoV-2 if they develop new COVID-19 symptoms and meet criteria for testing
- managed as a *case* if they test positive for SARS-CoV-2
- managed as a *close contact* if they meet the close contact definition.

7. Contacts

Close contact definition

The risk of developing COVID-19 increases with the amount of time and intimacy of contact a person has with an infectious case. People are identified as close contacts when that risk warrants public health measures to minimise the risk of further transmission.

The people at highest risk of developing COVID-19 are household and household like contacts of cases. In Australia, the ancestral strains of SARS-CoV-2 had an estimated household secondary attack rate of 22.5% (36). Estimates of household secondary attack rates vary according to the epidemiological context and VOCs*(Appendix A).*

PHUs should refer to their jurisdictional guidance for specific close contact definitions. Close contacts generally include:

- household and household like contacts
- other close contacts: in specific circumstances or where a significant transmission event has occurred, as identified by a PHU in keeping with jurisdictional protocols.

Management of contacts

While contact tracing and quarantine are effective measures against SARS-CoV-2 transmission, they are resource-intensive and disruptive to society (37). In the context of widespread community transmission, unless there is significant concern for a new VOC, close contact identification and management should be prioritised for high-risk settings. For the general population, other public health measures can be utilised as alternatives to quarantine. The duration of public health measures for close contacts should consider the *incubation period*.

PHUs should follow jurisdictional guidelines regarding the management of close contacts.

Options for management of close contacts

Public Health Measure	Possible management strategies for close contacts	When to apply
Stay at home when symptomatic	**All** close contacts should follow *recommendations to stay at home for people with acute respiratory symptoms*	Always
Testing	**Symptomatic** close contacts should get tested for SARS-CoV-2**.** **Asymptomatic** close contacts may undergo testing based on jurisdictional guidelines.	Refer to jurisdictional requirements
Quarantine	**If required**, the duration of quarantine should balance the likelihood of developing COVID-19 with the health, social and economic impacts associated with quarantine. A quarantine period of 7 days reduces transmission, with the majority of cases developing COVID-19 within 7 days from exposure (38).	Refer to jurisdictional guidance for close contact quarantine requirements.
Enhanced prevention activities	**All** people should follow *universal prevention activities.* Close contacts should also follow **additional** measures including: • Wear a mask when in an indoor setting outside of the home. • Work or study from home, where feasible. • Avoid high-risk settings. • Avoid contact with people at risk of severe illness.	Only for **asymptomatic** people where quarantine is not required Refer to jurisdictional guidance for specific information (including duration of requirements)
Communication	PHUs should stay up to date with jurisdictional advice and existing communication materials on close contact management, including translated resources. These may be used to tailor educational materials to support specific groups and develop localised communication strategies.	Always

8. List of appendices

These appendices are available through the *COVID-19 SoNG website*.

Appendix A. Current variants of concern

Appendix B. Additional guidance and resources

Appendix C. Glossary of terms

Appendix D. Full revision history

9. References

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Appendix A - Current variants of concern

What is a variant of concern?

SARS-CoV-2 evolves over time (a characteristic of all viruses), often with minimal impact on the properties of the virus. Some mutations, however, affect viral properties in a way that pose an increased risk to public health. For SARS-CoV-2, the Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE) monitors for such variants to determine if they meet the definition of a Variant of Interest (VOI) or a Variant of Concern (VOC) (see Appendix C – Glossary of Terms).

The TAG-VE identified five VOCs during the first two years of the pandemic, labelled under the WHO's simplified naming scheme as Alpha, Beta, Gamma, Delta, and Omicron.

Additional resources on variants of concern

Current variants of concern – Australian context

- *Communicable Diseases Genomics Network - variants of concern*
- *NSW Government Agency for Clinical Innovation – Living Evidence – SARS-CoV-2 variants*

Current variants of concern – Global context

- *WHO – Tracking SARS-CoV-2 variants*

What are the current variants of concern?

- B.1.617.2 (Delta) and sub-lineages AY
- B.1.1.529 (Omicron) and sub-lineages BA

What are the key characteristics of the current variants of concern in Australia?

Evidence is constantly evolving for current and emerging variants of concern (VOCs). The table below aims to summarise the key characteristics of current VOCs based on the best available evidence at time of publication, including:

- Basic reproduction number
- Incubation period
- Infectious period
- Clinical presentation, outcome and vaccine effectiveness
- Reinfection risk
- Household secondary attack rates

Other relevant characteristics will be presented if likely to have a detrimental impact on Australia's public health requiring review of the guidelines. Examples of such characteristics include resistance to therapeutics or decreased specificity and sensitivity of available diagnostics.

Table 1 Key characteristics of current variants of concern

Characteristic	B.1.617.2 (Delta) and sub-lineages AY	B.1.1.529 (Omicron) and sub-lineages BA
Basic Reproduction number *Ancestral strain estimated average: 3.28 (1)*	Estimated average: 5.08 (range 3.2 to 8) (1)	Estimated average: 9.5 (range 5.5 to 24) (2).
Incubation period *Ancestral strain estimated 5-6 days (range 1 to 14) (3, 4)*	Estimated average: 5.8 days 95th percentile was 11.3 days (5)	BA.1 sub-lineage estimated average: approximately 3 days (range 0 – 8 days) (6-10)
Infectious period *Ancestral strain (mild-moderate infections) ~ 48 hours prior to symptom onset to 10 days post symptom onset (11)*	Infectiousness peak ~ 1.3 days before symptom onset (5). Median time for viral culture to become negative in non-severe infections was 6 days after symptom onset (range 1 to 16 days) (12)	Preliminary evidence suggestive of pre-symptomatic transmission (8) Median time for viral culture to become negative in non-severe infections was 6 days after symptom onset (range 3-14 days) (12)
Clinical presentation and outcome	Evidence suggests Delta is associated with more severe disease than the Alpha variant (13).	Evidence suggests Omicron is associated with less severe disease than the Alpha and Delta variants (13).
Vaccine effectiveness[1]	2 doses: appear to provide >80% protection against severe disease after 5 months (14). 40-80% effective against symptomatic disease after 5 months (14). Booster dose: evidence suggests > 90% protection against symptomatic disease 2 weeks after booster dose (15).	2 doses: appear to provide >70% protection against severe disease after 6 months (16-18). <25% effective against symptomatic disease after 6 months (16, 17, 19). Booster dose: preliminary evidence suggests > 80% protection against severe disease (16-18). 40-70% protection against symptomatic disease (wanes over time).
Reinfection Risk	Prior SARS-CoV-2 infection provides an estimated 92% protection against reinfection with Delta (20).	Estimates prior infection with non-Omicron variants provide an estimated 60% time-limited protection against reinfection with Omicron (20). Preliminary evidence suggests effectiveness of BA.1 infection against **short-term** reinfection with BA.2 is around 95% (21).
Household secondary attack rate *Ancestral (Australia) ~ 22.5% (22)*	Australian estimates unavailable at time of publication United Kingdom estimates: 10.1% Denmark estimates: 21% (23)	Australian estimates unavailable at time of publication United Kingdom estimates: 13.6% Denmark estimates: 31% (23)

[1]Evidence is emerging. Data ranges are based on Comirnaty (Pfizer – BNT162b2), Vaxzevria (AstraZeneca – ChAdOx1), and Spikevac (Moderna – mRNA-1273) vaccines, where data available. May differ in people at very high-risk of severe disease.

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Additional guidance and resources

Jurisdictional (State/Territory) Guidance

Please see relevant state/territory guidance for COVID-19 information, currently effective directives, and helplines:

Jurisdiction	Public Health Guidance
Australian Capital Territory	COVID-19 information: *COVID-19 | ACT Government* Public Health Direction: *ACT Public Health Directions - COVID-19* COVID-19 Helpline: (02) 6207 7244
New South Wales	COVID-19 information: *COVID-19 (Coronavirus) | NSW Health | NSW Government* Public Health Orders: *Self-isolation - NSW legislation* Service NSW phone line: 13 77 88
Victoria	COVID-19 information: *Coronavirus (COVID-19) | health.vic.gov.au* Public Health Order: *Pandemic Order Register* COVID-19 Helpline: 1800 675 398
Queensland	COVID-19 information: *COVID-19 in Queensland | Health and wellbeing | Queensland Government (www.qld.gov.au)* Public Health Direction: *Chief Health Officer public health directions | Queensland Health* COVID-19 Helpline: 13 42 68
Tasmania	COVID-19 information: *Coronavirus disease (COVID-19)* Public Health Direction: *Resources | Coronavirus disease (COVID-19)* Public Health Hotline: 1800 671 738
Northern Territory	COVID-19 information: *Coronavirus (COVID-19) (nt.gov.au)* Public Health Direction: *Chief Health Officer Directions | Coronavirus (COVID-19) (nt.gov.au)* COVID-19 Hotline: 1800 490 484
South Australia	SA COVID-19 information: *SA.GOV.AU: COVID-19 | SA.GOV.AU: COVID-19* Public Health Direction: *Emergency Declaration and Directions | SA.GOV.AU: COVID-19* COVID-19 Information phone line: 1800 253 787

Western Australia	COVID-19 information: *COVID-19 (coronavirus) (health.wa.gov.au)* Public Health Direction: *COVID-19 coronavirus: State of Emergency Declarations (www.wa.gov.au)* COVID-19 Helpline: 13 268 43

Further guidance documents

Australian Health Protection Principal Committee (AHPPC)

AHPPC releases overarching *statements on COVID-19*, as the key decision-making committee, in response to the evolving COVID-19 situation in Australia. Statements include best practice testing and quarantine recommendations, vaccination mandates and high-risk setting considerations.

Australian Technical Advisory Group on Immunisation (ATAGI)

ATAGI releases *COVID-19 Vaccination Statements and Weekly COVID-19 meeting updates* outlining guidance relating to COVID-19 vaccines:

- *ATAGI statement on defining up to date status for COVID-19 vaccination* (February 2022)
- *Australian Technical Advisory Group on Immunisation (ATAGI) Clinical guidance on use of COVID-19 vaccine in Australia in 2021* (February 2022)

CDNA Guidelines

CDNA guidelines are available to support management of outbreaks in residential care facilities, Aboriginal and Torres Strait Islander communities, correctional facilities and specific settings such as schools and meat processing facilities. CDNA periodically reviews the following guidelines based on epidemiological context.

High risk settings and situations

- *CDNA national guidelines for the prevention, control and public health management of COVID-19 outbreaks in residential care facilities in Australia* (February 2022)
- *CDNA national guidelines for the prevention and management of COVID-19 outbreaks in disability residential services – The Disability Supplement* (June 2021)
- *CDNA National Guidance for remote Aboriginal and Torres Strait Islander communities for COVID-19* (February 2022)
- CDNA National Guidance for Urban and Regional Aboriginal and Torres Strait Islander Communities for COVID-19 (December 2020)
- CDNA *national guidelines for the prevention, control and public health management of COVID-19 outbreaks in correctional and detention facilities in Australia* (October 2021)
- *CDNA National Guidelines for Cruising in Australia* (May 2022)

Testing framework

- *Testing Framework for COVID-19 in Australia* (March 2022)

National Disease Surveillance Plan

- *Australian National Disease Surveillance Plan for COVID-19* (April 2021)

Communicable Diseases Genomic Network (CDGN)

Members of the CDGN are working together to develop protocols and processes that can support and enable interstate, multi-jurisdictional and national COVID-19 pathogen genomics and enhance surveillance activities across jurisdictions. Further information can be acquired from the following:

Please see CGDN guidance for information on SARS-CV-2 genomics:

- *CDGN Laboratory Case Definitions for SARS-CoV-2 Variants of Concern*
- *CDGN National COVID-19 Activities*
- *CDGN, PHLN and CDNA Sampling strategy for SARS-CoV-2 genomic surveillance* (November 2021)

Infection Control Expert Group (ICEG)

Please see ICEG guidance for information on best practice related to infection prevention and control methods in community, hospital and other institutional settings:

- *Infection Control Expert Group (ICEG) endorsed infection prevention and control guidance*

Public Health Laboratory Network (PHLN)

Please see PHLN guidance for information on best practice SARS-CoV-2 laboratory testing processes:

- *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2* (January 2022)
- *PHLN statement on reporting of SARS-CoV-2 variants of concern and interest* (November 2021)
- *PHLN and CDNA joint statement on SARS-CoV-2 rapid antigen tests* (February 2022)
- *PHLN Guidance on Nucleic Acid Test Result Interpretation for SARS-CoV-2* (September 2022)

Vaccine Safety Resources Therapeutic Good Administration (TGA)

Please see TGA guidelines for information on vaccine safety:

- *COVID-19 vaccine safety monitoring and reporting | Therapeutic Goods Administration (TGA)*
- AusVaxSafety active surveillance system

Appendix C: COVID-19 SoNG Glossary of terms

Term	Definition
Acute respiratory symptoms	The symptoms experienced by a person while they have a respiratory infection (infection of the nose, throat, larynx, trachea, bronchi and/or lungs). These symptoms may include (but are not limited to): cough, shortness of breath, sore throat, runny or blocked nose.
Ancestral strain	The original SARS-CoV-2 virus that was first reported in Wuhan, China, in December 2019.
Asymptomatic	Having no symptoms.
Case fatality ratio	The proportion of individuals diagnosed with a disease who die from that disease.
Close contact	A person who has been exposed to a COVID-19 case and meets the definition of a close contact for contact management purposes. This definition may vary between jurisdictions (see Appendix B for more information). Close contacts are at highest risk of developing the disease.
Confirmed COVID-19 case	A person meeting the laboratory definitive criteria for being a confirmed COVID-19 case (see CDNA COVID-19 Series of National Guidelines for more information).
Viral culture	A viral culture is a test to find viruses that can cause an infection. A sample of body fluid or tissue is collected and added to certain cells used to grow a virus. If no virus infects the cells, the culture is negative. If a virus that can cause infection infects the cells, the culture is positive.
Excess mortality	The difference between the observed numbers of deaths in specific time periods and expected numbers of deaths in the same time periods.
Exposure	Contact or potential contact with an infectious COVID-19 case
Genomic Surveillance	Collecting SARS-CoV-2 genomic sequence data from representative populations to detect new variants and monitor trends in circulating variants.
High-risk of severe disease	People with risk factors, such as older age or other health conditions, which contribute to a greater risk of serious illness due to COVID-19.
High-risk setting	In the context of widespread community transmission, high-risk settings are generally settings where there is both a: • high proportion of people at high-risk of severe disease (for example, due to age or chronic medical conditions) • higher risk of transmission due to close proximity and difficulty instituting control measures such as physical distancing or environmental controls. In the context of widespread community transmission, jurisdictions routinely define the following settings as high-risk: • Healthcare settings. • Residential care facilities. • Correctional and detention facilities.

	Jurisdictions may define additional settings as high-risk based on their epidemiological context.
Household	People who reside together within a single housing unit for the purposes of sleeping and acts of daily living e.g. sharing a meal.
Household-like	People who have spent a considerable period together resulting in an exposure similar to living in the same residential dwelling.
Incubation period	The time between exposure to a COVID-19 case and the first appearance of symptoms.
Infectious period	The time where a COVID-19 case is contagious and can pass on infection to other people.
Isolation	The separation away from others when a person is: • an infectious COVID-19 case • has symptoms compatible with COVID-19 and are awaiting test results.
Jurisdiction	An Australian state or territory
Natural infection	Infection of SARS-CoV-2 antigens eliciting an immune response and antibodies as opposed to vaccination.
Novel Coronavirus	A new coronavirus strain that has not been previously identified in humans.
Nucleic acid amplification testing	Tests which detect the presence of nucleic acids (the genetic material) of the SARS-CoV-2 virus. This includes polymerase chain reaction (PCR) tests.
Outbreak	A greater number of cases than what is normally expected in a given population. In closed populations, such as a residential facility, health authorities may define an outbreak as two or more cases in a given time period.
Personal protective equipment (PPE)	Equipment used to protect the wearer from SARS-CoV-2 infection. This may include surgical masks, particulate filter respirators (such as P2 or N95), gloves, goggles, glasses, face shields, gowns and aprons.
Pre-symptomatic	Refers to the period before symptoms appear among infected individuals.
Probable COVID--19 case	A person meeting the laboratory suggestive criteria for being a probable COVID-19 case (see CDNA COVID-19 Series of National Guidelines for more information).
Public health and social measures	Measures or actions by individuals, institutions, communities, local and national governments and international bodies to slow or stop the spread of an infectious disease.
Quarantine	The separation away from others when a person is well but may have been exposed to an infectious COVID-19 case
Rapid antigen testing	Tests which detect the presence of specific proteins of the virus. They are most accurate when used to test symptomatic individuals and can be used unsupervised with self-collected specimens. These tests are not as accurate at detecting the virus as a nucleic acid test.

Recombinant	A process in which the genomes of two SARS-CoV-2 variants (that have infected a person at the same time) combine during the viral replication process to form a new variant that is different from both parent lineages.
Re-exposure	Contact or potential contact with an infectious COVID-19 case after a person has recovered from COVID-19.
Reinfection	A subsequent confirmed SARS-CoV-2 infection in a person with a past known history of confirmed or probable COVID-19 that is determined to be separate to the previous infection based on epidemiological and/or laboratory findings (see CDNA COVID-19 Series of National Guidelines for more information).
Release from isolation	When a person no longer needs to isolate.
SARS-CoV-2	The virus that causes COVID-19 disease.
Secondary attack rate	A measure of the frequency of new cases among a specific group of susceptible people exposed to a primary case e.g., contacts.
Secondary transmission	Transmission of SARS-CoV-2 to a specific group of susceptible people exposed to a primary case e.g.contacts.
Variant	A variant is a viral genome (genetic code) that may contain one or more mutations to the ancestral strain (original virus).
Variant of concern	A SARS-CoV-2 variant with characteristics that make it more transmissible or cause more severe illness than the ancestral strain and may require additional public health action.
Viral shedding	Viral shedding occurs when a person releases viable copies of their virus from their bodies.
Viricidal products	Agents that kill viruses to make them noninfective.
Widespread community transmission	Multiple COVID-19 cases in the community, where the source is unknown and presumed to have been acquired from another case within that jurisdiction or country.
Whole genome sequencing	A method of genomic surveillance that describes the nucleic acid (DNA/RNA) sequence of an organism at a given moment in time.
Zoonotic	Diseases that are spread from animals to humans by ticks, mosquitoes, fleas, or contact with or consumption of animals.

Appendix D: Full revision history

Version	Date	Revised by	Changes
7.0	3 June 2022	Communicable Diseases Network Australia	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history.
6.7	22 March 2022	Communicable Diseases Network Australia	Updated: Release from isolation, Management of contacts
6.6	02 March 2022	Communicable Diseases Network Australia	Updated: Reinfection definition, Release from isolation criteria, Management of contacts
6.5	21 February 2022	Communicable Diseases Network Australia	Updated: Key definitions, The Disease, Routine prevention activities, Testing, Management of contacts, Special situations, Appendices
6.4	14 January 2022	Communicable Diseases Network Australia	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	Communicable Diseases Network Australia	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	Communicable Diseases Network Australia	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	Communicable Diseases Network Australia	Updated: Release from isolation criteria
6.0	08 November 2021	Communicable Diseases Network Australia	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	Communicable Diseases Network Australia	Revised: Contact management- Casual contacts
5.0	06 October 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	Communicable Diseases Network Australia	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	Communicable Diseases Network Australia	Revised: Case definition, Release from isolation criteria, Contact management

Version	Date	Revised by	Changes
7.0	3 June 2022	Communicable Diseases Network Australia	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history.
4.6	16 June 2021	Communicable Diseases Network Australia	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	Communicable Diseases Network Australia	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	Communicable Diseases Network Australia	Inclusion of new appendix: Appendix B: Outbreak investigation and management Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	Communicable Diseases Network Australia	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	Communicable Diseases Network Australia	Revised: Case definition
4.1	12 January 2021	Communicable Diseases Network Australia	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	Communicable Diseases Network Australia	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	Communicable Diseases Network Australia	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	Communicable Diseases Network Australia	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	Communicable Diseases Network Australia	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations.
3.8	23 August 2020	Communicable Diseases Network Australia	Revised: Modes of transmission, Release from isolation, Close contact definition – notes.
3.7	12 August 2020	Communicable Diseases Network Australia	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities.

Version	Date	Revised by	Changes
7.0	3 June 2022	Communicable Diseases Network Australia	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history.
3.6	30 July 2020	Communicable Diseases Network Australia	Revised: Case definition – Enhanced testing, Contact management.
3.5	24 July 2020	Communicable Diseases Network Australia	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results.
3.4	01 July 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections.
3.3	22 June 2020	Communicable Diseases Network Australia	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	Communicable Diseases Network Australia	Revised: Case definition – suspect case clinical criteria.
3.1	04 June 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, Case management – Release from isolation, Contact management.
3.0	28 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
2.11	22 May 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management.
2.10	13 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A.
2.9	05 May 2020	Communicable Diseases Network Australia	Revised: Case definition – clinical criteria.
2.8	01 May 2020	Communicable Diseases Network Australia	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B.
2.7	24 April 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management.

Version	Date	Revised by	Changes
7.0	3 June 2022	Communicable Diseases Network Australia	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history.
2.6	17 April 2020	Communicable Diseases Network Australia	Revised: Case management, Contact management – Close contact definition.
2.5	06 April 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.4	26 March 2020	Communicable Diseases Network Australia	Inclusion of advice for probable cases throughout.
2.3	24 March 2020	Communicable Diseases Network Australia	Revised: Case definition.
2.2	21 March 2020	Communicable Diseases Network Australia	Revised: Case management – Release from isolation.
2.1	20 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Special situations.
2.0	13 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
1.18	10 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section.
1.17	05 March 2020	Communicable Diseases Network Australia	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents.
1.16	04 March 2020	Communicable Diseases Network Australia	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section.
1.15	03 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Contact management.
1.14	02 March 2020	Communicable Diseases Network Australia	Revised: Case definition, Risk stratification of countries, Contact management.
1.13	28 February 2020	Communicable Diseases Network Australia	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information.
1.12	27 February 2020	Communicable Diseases Network Australia	Inclusion of Cambodia in the list of countries in the Person under investigation section.
1.11	26 February 2020	Communicable Diseases Network Australia	Inclusion of Italy in the list of countries in the Person Under Investigation section.

Version	Date	Revised by	Changes
7.0	3 June 2022	Communicable Diseases Network Australia	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history.
1.10	23 February 2020	Communicable Diseases Network Australia	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section.
1.9	21 February 2020	Communicable Diseases Network Australia	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted.
1.8	17 February 2020	Communicable Diseases Network Australia	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact.
1.7	15 February 2020	Communicable Diseases Network Australia	Revised case definition.
1.6	14 February 2020	Communicable Diseases Network Australia	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature.
1.5	07 February 2020	Communicable Diseases Network Australia	Inclusion of advice on release from isolation.
1.4	06 February 2020	Communicable Diseases Network Australia	Revised case definition and added rationale. Updated infection control advice throughout.
1.3	04 February 2020	Communicable Diseases Network Australia	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’.
1.2	02 February 2020	Communicable Diseases Network Australia	Revised the case definition, close and casual contact definitions and added self-isolation guidance.
1.1	27 January 2020	Communicable Diseases Network Australia	Removed references to Wuhan and revised the case definition.
1.0	23 January 2020	Communicable Diseases Network Australia	Developed by the 2019-nCoV Working Group.

Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 7.1

08 July 2022

Summary of revision history

Please note this table is a summary of key revisions to this guidance. For full revision history, refer to *Appendix D*.

Version	Date	Revised by	Changes
Version 7.1	08 July 2022	CDNA	Revised: Reinfection guidance.
Version 7.0	03 June 2022	CDNA	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history.
Version 6.0	08 November 2021	CDNA	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response
Version 5.0	06 October 2021	CDNA	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
Version 4.0	23 December 2020	CDNA	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
Version 3.0	28 May 2020	CDNA	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
Version 2.0	13 March 2020	CDNA	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
Version 1.0	23 January 2020	CDNA	Developed by the 2019-nCoV Working Group.

Disclaimer

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). The intention of these guidelines is to reflect the current evidence base, with pragmatic guidance provided where evidence is still evolving. Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Additional resources are available as appendices to support this guideline.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

CONTENTS

1. Summary

Public health priority

An automated electronic survey should be delivered to cases within 24 hours of notification to allow accurate reporting of cases and prioritisation for public health follow up.

Priority Classification	Public health response timeline
Urgent	Where there is concern for a new Variant of Concern, act as soon as possible – respond within 24 hours
High	Outbreaks in *high-risk settings*, act as soon as possible – respond within one working day
Routine	Individual cases in most community settings do not require individual follow up

Routine prevention activities

In the context of widespread community transmission, it is essential to implement *routine prevention activities* to minimise transmission of SARS-CoV-2.

Case management

Confirmed cases must isolate until they meet the appropriate *release from isolation criteria*.

Contact management

Contact management for COVID-19 is dependent on epidemiological context and jurisdictional guidance. In the context of widespread community transmission, contact tracing and management should be prioritised for high-risk settings. For the general population, other public health measures can be utilised. Please see *management of contacts* for further guidance.

2. The disease

Infectious agent

SARS-CoV-2 is the infectious agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 is the ninth coronavirus documented to affect humans, with all previous human coronaviruses having strong evidence of zoonotic origins (1). The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests zoonotic origins of SARS-CoV-2 are likely, with bats the possible source. However, the route of initial transmission to humans remains unclear and further investigation is required (2).

Disease occurrence and public health significance

The first cases of "pneumonia with unknown cause" detected in Wuhan, China, were notified to The World Health Organization (WHO) on 31 December 2019 (3). The cause was identified as a novel coronavirus and WHO declared the outbreak a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (4). WHO subsequently declared a pandemic on 12 March 2020 (5). Australia's first case of locally acquired COVID-19 was reported on 2 March 2020 (6). By 31 December 2021, two years since the first case was notified, the global excess mortality attributed to COVID-19 was estimated to be 18.2 million, well above the reported number of deaths of 5.94 million (7).

Variants of Concern and Interest

Like other viruses, SARS-CoV-2 evolves over time, often with minimal impact on its properties. Some mutations, however, affect the properties in a way that pose an increased risk to public health. The WHO Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE) monitors for such variants to determine if they meet the definition of a Variant of Interest (VOI) or a Variant of Concern (VOC).

The Communicable Diseases Genomics Network (CDGN) monitors VOCs in Australia. If the characteristics of emerging VOCs affect the properties of the virus in a way that significantly impacts Australia's public health, the guidance provided in this document may need to be adjusted.

A summary of current VOCs can be found in *Appendix A*. This includes information on the following key characteristics:

- reproduction number and transmission dynamics
- incubation period
- infectious period
- clinical presentation and outcome.

Mode of transmission

SARS-CoV-2 is primarily transmitted by exposure to infectious respiratory droplets and particles. Exposure occurs primarily through three routes (8):

- Inhalation of respiratory droplets and aerosolised particles.
- Deposits of respiratory droplets and particles on mucous membranes (mouth, nose, eyes).

- Touching of mucous membranes with hands directly contaminated with virus-containing respiratory fluids or indirectly by touching surfaces contaminated with virus-containing respiratory fluids.

Incubation period

The median incubation period of ancestral strains of SARS-CoV-2 is 5 to 6 days, with a range of 1 to 14 days (9-11). Studies have shown shorter incubation periods for both Delta and Omicron VOCs than ancestral SARS-CoV-2 (12-15). Please see *Appendix A* for further information on the characteristics of current VOCs.

Infectious period

Secondary transmission of SARS-CoV-2 can occur in pre-symptomatic and asymptomatic people and can continue as long as they shed whole live viruses (16-18). *Nucleic acid amplification testing (NAAT)* is not an effective measure of infectiousness as it can detect viral fragments that do not correlate with infectiousness. Studies have instead used viral cultures to estimate the duration of infectiousness for SARS-CoV-2. For the ancestral strains of SARS-CoV-2, people with mild-to-moderate illness were highly unlikely to be infectious more than 10 days after symptom onset (19). The infectious period, however, can vary based on individual factors and the VOC (see *Appendix A* for current VOC). Individuals with severe disease, or who are significantly immunocompromised may have prolonged infectious periods (20).

The infectious period for COVID-19 is generally taken from 48 hours prior to symptom onset (or positive test if asymptomatic) until release from isolation. The *isolation period* is covered later in this document.

Clinical presentation and outcome

COVID-19 usually presents with symptoms similar to other *acute respiratory infections (ARI).* Less commonly, SARS-CoV-2 can cause more severe disease including pneumonia, acute respiratory distress syndrome (ARDS), complications affecting other organ systems, and long-term sequelae (e.g. post COVID-19 condition).

In January 2022, two years after Australia's first COVID-19 case, Australia's reported case fatality ratio (CFR) was less than 0.2%, with approximately one third of Australia's deaths occurring in residential aged care facility residents (21). This is in comparison to a global CFR of approximately 1.2% (22).

For current information on COVID-19 case outcomes, please see *Coronavirus (COVID-19) case numbers and statistics | Australian Government Department of Health*

Evidence indicates that the severity of COVID-19 differs depending on the VOC, please see *Appendix A* for further information on current VOCs.

Groups at high risk of severe disease

Increasing **age** is the most important risk factor for severe disease, with risk significantly increasing around 60-70 years of age.

Unvaccinated or partially vaccinated people are at greater risk of severe disease.

Risk of severe disease also increases with:

- the number, severity and nature of comorbidities

- immunosuppression
- disability and frailty
- Aboriginal and Torres Strait Islander status
- pregnancy.

Further information is available on the Department of Health's website: *Risk factors for more serious illness*

High-risk settings and communities

In the context of widespread community transmission, high-risk settings are generally settings where there is both a:

- high proportion of people at high-risk of severe disease (for example, due to age or chronic medical conditions)
- higher risk of transmission due to close proximity and difficulty instituting control measures such as physical distancing or environmental controls.

In the context of widespread community transmission, jurisdictions routinely define the following settings as high-risk:

- Healthcare settings.
- Residential care facilities.
- Correctional and detention facilities.

Jurisdictions may define additional settings as high-risk based on their epidemiological context.

There are specific guidelines and risk matrices available for the management of COVID-19 in certain high-risk settings and communities. For a list of these guidelines, please see *Appendix B*.

3. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and where possible, disease transmission.

For current Australian Technical Advisory Group on Immunisation (ATAGI) recommendations and the latest evidence for COVID-19 vaccines, please see *ATAGI statement on defining up to date status for COVID-19 vaccination*, *ATAGI updated recommendations for a winter dose of COVID-19 vaccine* and *Clinical guidance for COVID-19 vaccine providers*.

For the latest information about Australia's COVID-19 vaccine rollout, please see *About Australia's COVID-19 vaccine rollout | Australian Government Department of Health.*

Recommendations to stay at home for people with acute respiratory symptoms

People with symptoms consistent with an acute respiratory infection (ARI) should **stay at home when sick** to help prevent the spread of all respiratory viruses, including SARS-CoV-2 (23, 24).

Except for medical care or other urgent reasons, people with acute respiratory symptoms should stay at home until:

- at least 24 hours has elapsed since their last fever episode (without the use of fever-reducing medications)
- there is significant improvement in their acute respiratory symptoms

People with acute respiratory symptoms should also undergo *testing* for SARS-CoV-2 and possibly other respiratory pathogens (e.g. multiplex PCR). If they receive a positive SARS-CoV-2 result they need to follow *isolation and restriction guidance* for COVID-19.

Symptoms of acute respiratory infection

An acute respiratory infection (ARI) is defined as a recent onset of new or worsening acute respiratory symptoms: cough, breathing difficulty, sore throat, or runny nose/nasal congestion with or without other symptoms (see below).

Other symptoms may include:

- headache, muscle aches (myalgia), fatigue, nausea or vomiting and diarrhoea. Loss of smell and taste and loss of appetite can also occur with COVID-19, but may be less common with new variants of the disease
- fever (≥37.5°C) can occur, however is less common in elderly individuals
- in the elderly, other symptoms to consider are new onset or increase in confusion, change in baseline behaviour, falling, or exacerbation of underlying chronic illness (e.g. increasing shortness of breath in someone with congestive heart failure).

Universal prevention activities

In the context of widespread community transmission, it is important for everyone to implement prevention activities to minimise transmission of SARS-CoV-2 and other respiratory infections. Evidence has demonstrated that public health measures are simple and effective in reducing SARS-CoV-2 transmission (25). The following measures should be applied at the individual, community and organisational level. Refer to jurisdictional guidelines for any additional requirements.

Universal prevention activities to minimise SARS-CoV-2 transmission[1]

Prevention type	Universal Prevention Activities	When Recommended
Respiratory virus protective measures	An effective public health measure to reduce the spread of all respiratory viruses is for people with acute respiratory symptoms to follow *recommendations to stay at home (23, 24)*.	Always
Personal hygiene	Irrespective of symptoms individuals should follow sound personal hygiene practices to prevent infection and transmission (25), including: • effective hand and respiratory hygiene • cleaning surfaces with viricidal products.	Always
Physical distancing and gathering	Physical distancing is associated with a reduction in infections (26). This benefit is likely to increase with increased physical distance. Physical distancing measures may include: • individuals to maintain a minimum distance from people of 1.5m • density restrictions in line with jurisdictional guidance.	Wherever feasible
Environmental controls	Improving indoor air quality (optimised ventilation) can reduce- transmission (27, 28).	Wherever feasible
Personal Protective Measures	To add an additional layer of protection and lower the risk of infection or transmission individuals may consider using PPE (e.g. wearing a face mask (29, 30).	When people with symptoms need to leave home for urgent reasons or medical care When indoors, or where physical distancing cannot be maintained outdoors

The above activities can be applied in line with the hierarchy of controls for preventing transmission of SARS-CoV-2. The hierarchy lists different risk mitigation and avoidance strategies including elimination, substitution, engineering controls, administrative controls and PPE. These are further outlined in the ICEG guidance *minimising the risk of infectious respiratory disease transmission in the context of COVID-19: the hierarchy of controls.*

[1] Jurisdictions may mandate certain prevention activities based on their epidemiological context. Please refer to jurisdictional guidance.

4. Surveillance

Surveillance objectives

The COVID-19 surveillance objectives are aligned with the epidemiological context of the pandemic. With widespread community transmission, the key public health surveillance objectives are to:

- Record, monitor and report number of cases and geographical distribution.
- Prioritise and manage clusters and outbreaks in high-risk settings and communities.
- Monitor the burden of disease including health care system impacts and excess mortality.
- Monitor SARS-CoV-2 variants through whole genome sequencing - to detect VOCs, to inform vaccine development and efficacy, and to inform public health action.
- Monitor the effectiveness of prevention and control activities.

Jurisdictions may have additional surveillance objectives. Please refer to jurisdictional guidance.

Reporting

With widespread community transmission of SARS-CoV-2, reporting priorities to central state/territory communicable diseases units should include:

- laboratory notification of positive SARS-CoV-2 NAAT results
- timely self-reporting of positive RAT results
- collection of case demographics and *risk factors for severe disease* through automated electronic surveys
- notification of clusters and outbreaks in high-risk settings and communities
- notification of COVID-19 cases in hospital and intensive care
- notification of COVID-19 related deaths.

Central state/territory communicable diseases units will provide data to the Australian Government Department of Health through the National Notifiable Diseases Surveillance System (NNDSS).

COVID-19 surveillance guidance

COVID-19 Surveillance Plan

The *Australian National Disease Surveillance Plan for COVID-19* (COVID-19 Surveillance Plan) describes Australia's national disease surveillance approach and outlines national surveillance goals, objectives and indicators.

Testing Framework

The *Testing Framework for COVID-19 in Australia* (COVID-19 Testing Framework) provides guidance on the use and appropriateness of different testing methods based on the epidemiological context and priority testing groups. The COVID-19 Testing Framework also provides information on minimum considerations for workplace surveillance and technical guidance for current and emerging SARS-CoV-2 testing technology and methods, including whole genome sequencing and wastewater surveillance.

Sampling strategy for SARS-CoV-2 genomic surveillance

The Communicable Diseases Genomics Network has developed the *Sampling strategy for SARS-CoV-2 genomic surveillance*. This strategy outlines an approach for genomic surveillance from comprehensive sequencing to selective and targeted sequencing in the context of widespread community transmission. For additional guidance please see *Appendix B*.

5. Testing

Public Health Units (PHUs) should follow jurisdictional testing guidance in line with the *COVID-19 Testing Framework*.

Primary testing methods

Details on the different testing methodologies for SARS-CoV-2 can be found at *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Nucleic acid amplification testing

Nucleic acid amplification testing (NAAT), e.g. reverse transcription polymerase chain reaction (RT-PCR), is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection. As NAAT is laboratory-based, capacity may be overwhelmed with high levels of community transmission.

Rapid antigen tests

Rapid antigen tests (RATs) are an alternative testing method that can be self-administered and provide fast results following the collection of a respiratory sample. RAT sensitivity is inherently lower than NAAT. Performance of different RATs can vary from test to test and depend on the VOC and the prevalence of infection in the community.

Testing recommendations

Anyone with COVID-19 compatible symptoms should continue to be tested for SARS-CoV-2.

In the context of **widespread community transmission**:

- NAAT should be prioritised to ensure availability for:
  - People who need to be considered for treatment, including those:
    - *at high-risk of severe disease*
  - People who require hospital level care for their symptoms.
  - People in circumstances when additional control measures may be required:
    - for those at risk of exposing people at high-risk of severe disease including those who live or work in a *high-risk setting*
    - when there is concern regarding a new VOC.
- RATs may be used for other symptomatic people when NAAT is unavailable or there is need to relieve pressure on laboratory systems

A positive RAT result will not require a confirmatory NAAT and should be treated as a probable case. Anyone with a positive RAT should register this result as directed by the jurisdictional public health order/direction.

6. Cases

Definitions

Reporting

Notify confirmed and probable cases. Refer to jurisdictional guidance for specific notification requirements.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires *laboratory definitive evidence*.

Laboratory definitive evidence:

- Detection of SARS-CoV-2 by nucleic amplification acid testing (NAAT); or
- Isolation of SARS-CoV-2 in cell culture, with confirmation using a NAAT; or
- SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Probable case

A probable case includes individuals who have *laboratory suggestive evidence*

Laboratory suggestive evidence:

- Detection of SARS-CoV-2 by rapid antigen testing (RAT)

Reinfection

Reinfection is a subsequent confirmed SARS-CoV-2 infection in a person with a recent known history of confirmed or probable COVID-19 that is determined to be separate to the previous infection based on epidemiological and/or laboratory findings.

Automated surveillance systems will not routinely count positive results within 28 days of an individual being released from isolation. See *re-exposure and reinfection following recovery from COVID-19* for further information. PHUs should follow jurisdictional advice.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed or probable COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

Case management

Response times

Automated electronic survey should be delivered to cases within 24 hours of notification to allow accurate reporting of cases and prioritisation for public health follow up. Refer to jurisdictional guidelines for specific requirements.

Priority Classification	Public health response timeline
Urgent	Where there is concern for a new Variant of Concern, act as soon as possible – respond within 24 hours
High	Outbreaks in *high-risk settings*, act as soon as possible – respond within one working day
Routine	Individual cases in most community settings do not require individual follow up

Case investigation

An automated case management system should prioritise cases to allow targeted follow up where appropriate, particularly in high-risk settings.

Where automated case management systems are utilised, jurisdictions should ensure cases are provided with accessible and up to date information on how to manage their illness, access medical care, and understand their isolation requirements.

In addition to automated case management systems, jurisdictions may also consider a random or targeted selection of case interviews. This can help monitor for changes in disease epidemiology and assist in modelling projections of future COVID-19 case counts.

Clinical management

The *National COVID-19 Clinical Evidence Taskforce* provides up to date clinical guidance for COVID-19 cases, including supportive therapy and oral treatments against severe disease. Public health responses are not routinely involved in individual clinical management. During the course of public health response, cases identified at high-risk of severe disease may be linked with appropriate clinical services.

Isolation and restriction guidance

Isolation of COVID-19 cases is effective in reducing the spread of disease. The ideal duration of isolation should be determined based on the infectious period of the current VOC (see *Appendix A*). A minimum standard for release from isolation is outlined below.

Minimum release from isolation criteria for COVID-19 cases

This minimum standard aims to balance this risk with the impact of prolonged isolation on individuals and communities. A small proportion of cases may still be infectious when released from isolation based on these criteria.

Cases can be released from isolation 7 days after their first positive test if they meet the following criteria:

- **Substantial resolution of their acute respiratory symptoms**
- **No fever for 24 hours without the use of fever reducing medications**

Cases who do not meet the above criteria after 7 days should remain isolated until these criteria are met.

Additional requirements for high-risk settings

High-risk settings should consider additional requirements due to the impact transmission can have in these settings. These may include:

- Patient/resident deisolation guidance and procedures
- Staff return to work guidance
- Guidance for visitors attending high-risk settings

Guidance should be tailored to the level of risk for each setting type or, where required, tailored to the individual (e.g. severely unwell hospital inpatients). Guidance may include longer isolation periods, additional testing requirements, and individual assessment for significantly immunocompromised people[3].

Please refer to jurisdictional guidance and additional resources in *Appendix B*.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who: have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm3; are receiving dialysis; or other conditions specifically noted by the treating medical practitioner. ATAGI presents their definition for significantly immunocompromised in their *recommendations on the use of a third primary dose of COVID-19 vaccine in individuals who are severely immunocompromised.*

Re-exposure and reinfection following recovery from COVID-19

Reinfection is possible following recent and/or prior recovery from COVID-19 (31-33). VOCs that demonstrate increased immune evasion have a greater likelihood of causing reinfections. The extent of protection provided by natural infection is dependent on the VOCs circulating in the community. Emerging evidence is being closely monitored and information on current VOCs is outlined in *Appendix A*. The risk of reinfection is generally higher in people who are significantly immunocompromised (32, 34, 35).

Re-exposure within 28 days of release from isolation

If a person meets the close contact definition within 28 days of release from isolation and is **asymptomatic,** they do not need to follow close contact requirements or undergo SARS-CoV-2 testing for screening purposes.

If they become **symptomatic,** they should follow the guidance below for *all people who develop new symptoms within 28 days of release from isolation*.

Guidance for all people who develop new symptoms within 28 days of release from isolation

To reduce the transmission of all respiratory viruses, including SARS-CoV-2, all people who develop new acute respiratory symptoms within 28 days of release from isolation should follow *recommendations to stay at home for people with acute respiratory symptoms*. This is irrespective of whether they have a known re-exposure or not.

People who are at higher risk of severe COVID-19 disease who develop new symptoms within 28 days of release from isolation should contact their health care provider for advice; testing for COVID-19 and other respiratory viruses such as influenza and respiratory syncytial virus (RSV) may be indicated.

Guidance for recovered cases more than 28 days of release from isolation

If more than 28 days have passed after release from isolation, recovered cases should be:

- tested for SARS-CoV-2 if they develop new COVID-19 symptoms and meet criteria for testing
- managed as a *case* if they test positive for SARS-CoV-2
- managed as a *close contact* if they meet the close contact definition.

7. Contacts

Close contact definition

The risk of developing COVID-19 increases with the amount of time and intimacy of contact a person has with an infectious case. People are identified as close contacts when that risk warrants public health measures to minimise the risk of further transmission.

The people at highest risk of developing COVID-19 are household and household like contacts of cases. In Australia, the ancestral strains of SARS-CoV-2 had an estimated household secondary attack rate of 22.5% (36). Estimates of household secondary attack rates vary according to the epidemiological context and VOCs*(Appendix A).*

PHUs should refer to their jurisdictional guidance for specific close contact definitions. Close contacts generally include:

- household and household like contacts
- other close contacts: in specific circumstances or where a significant transmission event has occurred, as identified by a PHU in keeping with jurisdictional protocols.

Management of contacts

While contact tracing and quarantine are effective measures against SARS-CoV-2 transmission, they are resource-intensive and disruptive to society (37). In the context of widespread community transmission, unless there is significant concern for a new VOC, close contact identification and management should be prioritised for high-risk settings. For the general population, other public health measures can be utilised as alternatives to quarantine. The duration of public health measures for close contacts should consider the *incubation period*.

PHUs should follow jurisdictional guidelines regarding the management of close contacts.

Options for management of close contacts

Public Health Measure	Possible management strategies for close contacts	When to apply
Stay at home when symptomatic	**All** close contacts should follow *recommendations to stay at home for people with acute respiratory symptoms*	Always
Testing	**Symptomatic** close contacts should get tested for SARS-CoV-2**.** **Asymptomatic** close contacts may undergo testing based on jurisdictional guidelines.	Refer to jurisdictional requirements
Quarantine	**If required**, the duration of quarantine should balance the likelihood of developing COVID-19 with the health, social and economic impacts associated with quarantine. A quarantine period of 7 days reduces transmission, with the majority of cases developing COVID-19 within 7 days from exposure (38).	Refer to jurisdictional guidance for close contact quarantine requirements.
Enhanced prevention activities	**All** people should follow *universal prevention activities.* Close contacts should also follow **additional** measures including: • Wear a mask when in an indoor setting outside of the home. • Work or study from home, where feasible. • Avoid high-risk settings. • Avoid contact with people at risk of severe illness.	Only for **asymptomatic** people where quarantine is not required Refer to jurisdictional guidance for specific information (including duration of requirements)
Communication	PHUs should stay up to date with jurisdictional advice and existing communication materials on close contact management, including translated resources. These may be used to tailor educational materials to support specific groups and develop localised communication strategies.	Always

8. List of appendices

These appendices are available through the *COVID-19 SoNG website*.

Appendix A. Current variants of concern

Appendix B. Additional guidance and resources

Appendix C. Glossary of terms

Appendix D. Full revision history

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Australian Government
Department of Health

Communicable Diseases network AUSTRALIA

Coronavirus Disease 2019 (COVID-19)

CDNA National Guidelines for Public Health Units

Version 7.2

22 July 2022

Summary of revision history

Please note this table is a summary of key revisions to this guidance. For full revision history, refer to *Appendix D*.

Version	Date	Revised by	Changes
Version 7.2	22 July 2022	CDNA	Revised: Reinfection definition.
Version 7.1	08 July 2022	CDNA	Revised: Reinfection guidance.
Version 7.0	03 June 2022	CDNA	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history.
Version 6.0	08 November 2021	CDNA	Revisions reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response
Version 5.0	06 October 2021	CDNA	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
Version 4.0	23 December 2020	CDNA	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
Version 3.0	28 May 2020	CDNA	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings.
Version 2.0	13 March 2020	CDNA	Revised: Case definition, Contact management, Laboratory testing, Appendix A.
Version 1.0	23 January 2020	CDNA	Developed by the 2019-nCoV Working Group.

Disclaimer

These guidelines outline Australia's national minimum standard for surveillance, laboratory testing, case management and contact management for coronavirus disease 2019 (COVID-19). The intention of these guidelines is to reflect the current evidence base, with pragmatic guidance provided where evidence is still evolving. Jurisdictions may implement policies that exceed the national minimum standard based on local epidemiological context. CDNA will review and update these recommendations as new information becomes available on COVID-19 and the situation in Australia.

Additional resources are available as appendices to support this guideline.

Readers should not rely solely on the information contained within these guidelines. Guideline information is not intended to be a substitute for advice from other relevant sources including, but not limited to, the advice from a public health specialist or other health professional. Clinical judgement and discretion may be required in the interpretation and application of these guidelines.

The membership of the CDNA and the Australian Health Principal Protection Principal Committee (AHPPC), and the Australian Government as represented by the Department of Health (Health) do not warrant or represent that the information contained in these guidelines is accurate, current or complete. The CDNA, the AHPPC and Health do not accept any legal liability or responsibility for any loss, damages, costs or expenses incurred by the use of, or reliance on, or interpretation of, the information contained in these guidelines.

CONTENTS

1. Summary

Public health priority

An automated electronic survey should be delivered to cases within 24 hours of notification to allow accurate reporting of cases and prioritisation for public health follow up.

Priority Classification	Public health response timeline
Urgent	Where there is concern for a new Variant of Concern, act as soon as possible – respond within 24 hours
High	Outbreaks in *high-risk settings*, act as soon as possible – respond within one working day
Routine	Individual cases in most community settings do not require individual follow up

Routine prevention activities

In the context of widespread community transmission, it is essential to implement *routine prevention activities* to minimise transmission of SARS-CoV-2.

Case management

Confirmed cases must isolate until they meet the appropriate *release from isolation criteria*.

Contact management

Contact management for COVID-19 is dependent on epidemiological context and jurisdictional guidance. In the context of widespread community transmission, contact tracing and management should be prioritised for high-risk settings. For the general population, other public health measures can be utilised. Please see *management of contacts* for further guidance.

2. The disease

Infectious agent

SARS-CoV-2 is the infectious agent that causes COVID-19. SARS-CoV-2 is a novel coronavirus that was first identified in humans in Wuhan, China, in December 2019. SARS-CoV-2 is the ninth coronavirus documented to affect humans, with all previous human coronaviruses having strong evidence of zoonotic origins (1). The *WHO-convened Global Study of Origins of SARS-CoV-2: China Part* suggests zoonotic origins of SARS-CoV-2 are likely, with bats the possible source. However, the route of initial transmission to humans remains unclear and further investigation is required (2).

Disease occurrence and public health significance

The first cases of "pneumonia with unknown cause" detected in Wuhan, China, were notified to The World Health Organization (WHO) on 31 December 2019 (3). The cause was identified as a novel coronavirus and WHO declared the outbreak a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 (4). WHO subsequently declared a pandemic on 12 March 2020 (5). Australia's first case of locally acquired COVID-19 was reported on 2 March 2020 (6). By 31 December 2021, two years since the first case was notified, the global excess mortality attributed to COVID-19 was estimated to be 18.2 million, well above the reported number of deaths of 5.94 million (7).

Variants of Concern and Interest

Like other viruses, SARS-CoV-2 evolves over time, often with minimal impact on its properties. Some mutations, however, affect the properties in a way that pose an increased risk to public health. The WHO Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE) monitors for such variants to determine if they meet the definition of a Variant of Interest (VOI) or a Variant of Concern (VOC).

The Communicable Diseases Genomics Network (CDGN) monitors VOCs in Australia. If the characteristics of emerging VOCs affect the properties of the virus in a way that significantly impacts Australia's public health, the guidance provided in this document may need to be adjusted.

A summary of current VOCs can be found in *Appendix A*. This includes information on the following key characteristics:

- reproduction number and transmission dynamics
- incubation period
- infectious period
- clinical presentation and outcome.

Mode of transmission

SARS-CoV-2 is primarily transmitted by exposure to infectious respiratory droplets and particles. Exposure occurs primarily through three routes (8):

- Inhalation of respiratory droplets and aerosolised particles.
- Deposits of respiratory droplets and particles on mucous membranes (mouth, nose, eyes).

- Touching of mucous membranes with hands directly contaminated with virus-containing respiratory fluids or indirectly by touching surfaces contaminated with virus-containing respiratory fluids.

Incubation period

The median incubation period of ancestral strains of SARS-CoV-2 is 5 to 6 days, with a range of 1 to 14 days (9-11). Studies have shown shorter incubation periods for both Delta and Omicron VOCs than ancestral SARS-CoV-2 (12-15). Please see *Appendix A* for further information on the characteristics of current VOCs.

Infectious period

Secondary transmission of SARS-CoV-2 can occur in pre-symptomatic and asymptomatic people and can continue as long as they shed whole live viruses (16-18). *Nucleic acid amplification testing (NAAT)* is not an effective measure of infectiousness as it can detect viral fragments that do not correlate with infectiousness. Studies have instead used viral cultures to estimate the duration of infectiousness for SARS-CoV-2. For the ancestral strains of SARS-CoV-2, people with mild-to-moderate illness were highly unlikely to be infectious more than 10 days after symptom onset (19). The infectious period, however, can vary based on individual factors and the VOC (see *Appendix A* for current VOC). Individuals with severe disease, or who are significantly immunocompromised may have prolonged infectious periods (20).

The infectious period for COVID-19 is generally taken from 48 hours prior to symptom onset (or positive test if asymptomatic) until release from isolation. The *isolation period* is covered later in this document.

Clinical presentation and outcome

COVID-19 usually presents with symptoms similar to other *acute respiratory infections (ARI).* Less commonly, SARS-CoV-2 can cause more severe disease including pneumonia, acute respiratory distress syndrome (ARDS), complications affecting other organ systems, and long-term sequelae (e.g. post COVID-19 condition).

In January 2022, two years after Australia's first COVID-19 case, Australia's reported case fatality ratio (CFR) was less than 0.2%, with approximately one third of Australia's deaths occurring in residential aged care facility residents (21). This is in comparison to a global CFR of approximately 1.2% (22).

For current information on COVID-19 case outcomes, please see *Coronavirus (COVID-19) case numbers and statistics | Australian Government Department of Health*

Evidence indicates that the severity of COVID-19 differs depending on the VOC, please see *Appendix A* for further information on current VOCs.

Groups at high risk of severe disease

Increasing **age** is the most important risk factor for severe disease, with risk significantly increasing around 60-70 years of age.

Unvaccinated or partially vaccinated people are at greater risk of severe disease.

Risk of severe disease also increases with:

- the number, severity and nature of comorbidities

- immunosuppression
- disability and frailty
- Aboriginal and Torres Strait Islander status
- pregnancy.

Further information is available on the Department of Health's website: *Risk factors for more serious illness*

High-risk settings and communities

In the context of widespread community transmission, high-risk settings are generally settings where there is both a:

- high proportion of people at high-risk of severe disease (for example, due to age or chronic medical conditions)
- higher risk of transmission due to close proximity and difficulty instituting control measures such as physical distancing or environmental controls.

In the context of widespread community transmission, jurisdictions routinely define the following settings as high-risk:

- Healthcare settings.
- Residential care facilities.
- Correctional and detention facilities.

Jurisdictions may define additional settings as high-risk based on their epidemiological context.

There are specific guidelines and risk matrices available for the management of COVID-19 in certain high-risk settings and communities. For a list of these guidelines, please see *Appendix B*.

3. Routine prevention activities

Vaccination

The COVID-19 vaccination program commenced in Australia on 22 February 2021. The overarching goal of the program is to protect all people in Australia from the harm caused by SARS-CoV-2, through preventing serious illness and death, and where possible, disease transmission.

For current Australian Technical Advisory Group on Immunisation (ATAGI) recommendations and the latest evidence for COVID-19 vaccines, please see *ATAGI statement on defining up to date status for COVID-19 vaccination*, *ATAGI updated recommendations for a winter dose of COVID-19 vaccine* and *Clinical guidance for COVID-19 vaccine providers*.

For the latest information about Australia's COVID-19 vaccine rollout, please see *About Australia's COVID-19 vaccine rollout | Australian Government Department of Health.*

Recommendations to stay at home for people with acute respiratory symptoms

People with symptoms consistent with an acute respiratory infection (ARI) should **stay at home when sick** to help prevent the spread of all respiratory viruses, including SARS-CoV-2 (23, 24).

Except for medical care or other urgent reasons, people with acute respiratory symptoms should stay at home until:

- at least 24 hours has elapsed since their last fever episode (without the use of fever-reducing medications)
- there is significant improvement in their acute respiratory symptoms

People with acute respiratory symptoms should also undergo *testing* for SARS-CoV-2 and possibly other respiratory pathogens (e.g. multiplex PCR). If they receive a positive SARS-CoV-2 result they need to follow *isolation and restriction guidance* for COVID-19.

Symptoms of acute respiratory infection

An acute respiratory infection (ARI) is defined as a recent onset of new or worsening acute respiratory symptoms: cough, breathing difficulty, sore throat, or runny nose/nasal congestion with or without other symptoms (see below).

Other symptoms may include:

- headache, muscle aches (myalgia), fatigue, nausea or vomiting and diarrhoea. Loss of smell and taste and loss of appetite can also occur with COVID-19, but may be less common with new variants of the disease
- fever (≥37.5°C) can occur, however is less common in elderly individuals
- in the elderly, other symptoms to consider are new onset or increase in confusion, change in baseline behaviour, falling, or exacerbation of underlying chronic illness (e.g. increasing shortness of breath in someone with congestive heart failure).

Universal prevention activities

In the context of widespread community transmission, it is important for everyone to implement prevention activities to minimise transmission of SARS-CoV-2 and other respiratory infections. Evidence has demonstrated that public health measures are simple and effective in reducing SARS-CoV-2 transmission (25). The following measures should be applied at the individual, community and organisational level. Refer to jurisdictional guidelines for any additional requirements.

Universal prevention activities to minimise SARS-CoV-2 transmission[1]

Prevention type	Universal Prevention Activities	When Recommended
Respiratory virus protective measures	An effective public health measure to reduce the spread of all respiratory viruses is for people with acute respiratory symptoms to follow *recommendations to stay at home (23, 24)*.	Always
Personal hygiene	Irrespective of symptoms individuals should follow sound personal hygiene practices to prevent infection and transmission (25), including: • effective hand and respiratory hygiene • cleaning surfaces with viricidal products.	Always
Physical distancing and gathering	Physical distancing is associated with a reduction in infections (26). This benefit is likely to increase with increased physical distance. Physical distancing measures may include: • individuals to maintain a minimum distance from people of 1.5m • density restrictions in line with jurisdictional guidance.	Wherever feasible
Environmental controls	Improving indoor air quality (optimised ventilation) can reduce- transmission (27, 28).	Wherever feasible
Personal Protective Measures	To add an additional layer of protection and lower the risk of infection or transmission individuals may consider using PPE (e.g. wearing a face mask (29, 30).	When people with symptoms need to leave home for urgent reasons or medical care When indoors, or where physical distancing cannot be maintained outdoors

The above activities can be applied in line with the hierarchy of controls for preventing transmission of SARS-CoV-2. The hierarchy lists different risk mitigation and avoidance strategies including elimination, substitution, engineering controls, administrative controls and PPE. These are further outlined in the ICEG guidance *minimising the risk of infectious respiratory disease transmission in the context of COVID-19: the hierarchy of controls.*

[1] Jurisdictions may mandate certain prevention activities based on their epidemiological context. Please refer to jurisdictional guidance.

4. Surveillance

Surveillance objectives

The COVID-19 surveillance objectives are aligned with the epidemiological context of the pandemic. With widespread community transmission, the key public health surveillance objectives are to:

- Record, monitor and report number of cases and geographical distribution.
- Prioritise and manage clusters and outbreaks in high-risk settings and communities.
- Monitor the burden of disease including health care system impacts and excess mortality.
- Monitor SARS-CoV-2 variants through whole genome sequencing - to detect VOCs, to inform vaccine development and efficacy, and to inform public health action.
- Monitor the effectiveness of prevention and control activities.

Jurisdictions may have additional surveillance objectives. Please refer to jurisdictional guidance.

Reporting

With widespread community transmission of SARS-CoV-2, reporting priorities to central state/territory communicable diseases units should include:

- laboratory notification of positive SARS-CoV-2 NAAT results
- timely self-reporting of positive RAT results
- collection of case demographics and *risk factors for severe disease* through automated electronic surveys
- notification of clusters and outbreaks in high-risk settings and communities
- notification of COVID-19 cases in hospital and intensive care
- notification of COVID-19 related deaths.

Central state/territory communicable diseases units will provide data to the Australian Government Department of Health through the National Notifiable Diseases Surveillance System (NNDSS).

COVID-19 surveillance guidance

COVID-19 Surveillance Plan

The *Australian National Disease Surveillance Plan for COVID-19* (COVID-19 Surveillance Plan) describes Australia's national disease surveillance approach and outlines national surveillance goals, objectives and indicators.

Testing Framework

The *Testing Framework for COVID-19 in Australia* (COVID-19 Testing Framework) provides guidance on the use and appropriateness of different testing methods based on the epidemiological context and priority testing groups. The COVID-19 Testing Framework also provides information on minimum considerations for workplace surveillance and technical guidance for current and emerging SARS-CoV-2 testing technology and methods, including whole genome sequencing and wastewater surveillance.

Sampling strategy for SARS-CoV-2 genomic surveillance

The Communicable Diseases Genomics Network has developed the *Sampling strategy for SARS-CoV-2 genomic surveillance*. This strategy outlines an approach for genomic surveillance from comprehensive sequencing to selective and targeted sequencing in the context of widespread community transmission. For additional guidance please see *Appendix B*.

5. Testing

Public Health Units (PHUs) should follow jurisdictional testing guidance in line with the *COVID-19 Testing Framework*.

Primary testing methods

Details on the different testing methodologies for SARS-CoV-2 can be found at *Public Health Laboratory Network (PHLN) guidance on laboratory testing for SARS-CoV-2.*

Nucleic acid amplification testing

Nucleic acid amplification testing (NAAT), e.g. reverse transcription polymerase chain reaction (RT-PCR), is the gold standard for diagnosing acute symptomatic SARS-CoV-2 infection. As NAAT is laboratory-based, capacity may be overwhelmed with high levels of community transmission.

Rapid antigen tests

Rapid antigen tests (RATs) are an alternative testing method that can be self-administered and provide fast results following the collection of a respiratory sample. RAT sensitivity is inherently lower than NAAT. Performance of different RATs can vary from test to test and depend on the VOC and the prevalence of infection in the community.

Testing recommendations

Anyone with COVID-19 compatible symptoms should continue to be tested for SARS-CoV-2.

In the context of **widespread community transmission**:

- NAAT should be prioritised to ensure availability for:
  - People who need to be considered for treatment, including those:
    - *at high-risk of severe disease*
  - People who require hospital level care for their symptoms.
  - People in circumstances when additional control measures may be required:
    - for those at risk of exposing people at high-risk of severe disease including those who live or work in a *high-risk setting*
    - when there is concern regarding a new VOC.
- RATs may be used for other symptomatic people when NAAT is unavailable or there is need to relieve pressure on laboratory systems

A positive RAT result will not require a confirmatory NAAT and should be treated as a probable case. Anyone with a positive RAT should register this result as directed by the jurisdictional public health order/direction.

6. Cases

Definitions

Reporting

Notify confirmed and probable cases. Refer to jurisdictional guidance for specific notification requirements.

Confirmed case

The confirmed case definition intends to capture newly diagnosed cases with laboratory definitive evidence to support a diagnosis.

A confirmed case requires *laboratory definitive evidence*.

Laboratory definitive evidence:

- Detection of SARS-CoV-2 by nucleic amplification acid testing (NAAT); or
- Isolation of SARS-CoV-2 in cell culture, with confirmation using a NAAT; or
- SARS-CoV-2 IgG seroconversion or a four-fold or greater increase in SARS-CoV-2 antibodies of any immunoglobulin subclass including 'total' assays in acute and convalescent sera, in the absence of vaccination[2].

Probable case

A probable case includes individuals who have *laboratory suggestive evidence*

Laboratory suggestive evidence:

- Detection of SARS-CoV-2 by rapid antigen testing (RAT)

Reinfection

Reinfection is a subsequent confirmed or probable SARS-CoV-2 infection in a person with a recent known history of confirmed or probable COVID-19 that is determined to be separate to the previous infection based on epidemiological and/or laboratory findings.

Automated surveillance systems will not routinely count positive results within 28 days of an individual being released from isolation. See *re-exposure and reinfection following recovery from COVID-19* for further information. PHUs should follow jurisdictional advice.

COVID-19 death

A COVID-19 death is defined for surveillance purposes as a death in a confirmed or probable COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. Where a Coroner's report is available, these findings are to be observed.

[2] Antibody detection must be by a validated assay and included in an external quality assurance program. For all serological responses to be counted as laboratory evidence, a person should not have had a previous COVID-19 vaccination.

Case management

Response times

Automated electronic survey should be delivered to cases within 24 hours of notification to allow accurate reporting of cases and prioritisation for public health follow up. Refer to jurisdictional guidelines for specific requirements.

Priority Classification	Public health response timeline
Urgent	Where there is concern for a new Variant of Concern, act as soon as possible – respond within 24 hours
High	Outbreaks in *high-risk settings*, act as soon as possible – respond within one working day
Routine	Individual cases in most community settings do not require individual follow up

Case investigation

An automated case management system should prioritise cases to allow targeted follow up where appropriate, particularly in high-risk settings.

Where automated case management systems are utilised, jurisdictions should ensure cases are provided with accessible and up to date information on how to manage their illness, access medical care, and understand their isolation requirements.

In addition to automated case management systems, jurisdictions may also consider a random or targeted selection of case interviews. This can help monitor for changes in disease epidemiology and assist in modelling projections of future COVID-19 case counts.

Clinical management

The *National COVID-19 Clinical Evidence Taskforce* provides up to date clinical guidance for COVID-19 cases, including supportive therapy and oral treatments against severe disease. Public health responses are not routinely involved in individual clinical management. During the course of public health response, cases identified at high-risk of severe disease may be linked with appropriate clinical services.

Isolation and restriction guidance

Isolation of COVID-19 cases is effective in reducing the spread of disease. The ideal duration of isolation should be determined based on the infectious period of the current VOC (see *Appendix A*). A minimum standard for release from isolation is outlined below.

Minimum release from isolation criteria for COVID-19 cases

This minimum standard aims to balance this risk with the impact of prolonged isolation on individuals and communities. A small proportion of cases may still be infectious when released from isolation based on these criteria.

Cases can be released from isolation 7 days after their first positive test if they meet the following criteria:

- **Substantial resolution of their acute respiratory symptoms**
- **No fever for 24 hours without the use of fever reducing medications**

Cases who do not meet the above criteria after 7 days should remain isolated until these criteria are met.

Additional requirements for high-risk settings

High-risk settings should consider additional requirements due to the impact transmission can have in these settings. These may include:

- Patient/resident deisolation guidance and procedures
- Staff return to work guidance
- Guidance for visitors attending high-risk settings

Guidance should be tailored to the level of risk for each setting type or, where required, tailored to the individual (e.g. severely unwell hospital inpatients). Guidance may include longer isolation periods, additional testing requirements, and individual assessment for significantly immunocompromised people[3].

Please refer to jurisdictional guidance and additional resources in *Appendix B*.

[3] Persons who are clinically assessed as being significantly immunocompromised may have a reduced ability to effectively clear SARS-CoV-2 and a prolonged infectious period. Significantly immunocompromised persons may include, but are not limited to, those who: have had an organ transplant and are on immune suppressive therapy; have had a haematopoietic stem cell transplant in the past 2 years; are on immune suppressive therapy for graft versus host disease; have had an active haematological malignancy; human immunodeficiency virus infection with CD4 T-lymphocyte count below 200 cells/per mm3; are receiving dialysis; or other conditions specifically noted by the treating medical practitioner. ATAGI presents their definition for significantly immunocompromised in their *recommendations on the use of a third primary dose of COVID-19 vaccine in individuals who are severely immunocompromised.*

Re-exposure and reinfection following recovery from COVID-19

Reinfection is possible following recent and/or prior recovery from COVID-19 (31-33). VOCs that demonstrate increased immune evasion have a greater likelihood of causing reinfections. The extent of protection provided by natural infection is dependent on the VOCs circulating in the community. Emerging evidence is being closely monitored and information on current VOCs is outlined in *Appendix A*. The risk of reinfection is generally higher in people who are significantly immunocompromised (32, 34, 35).

Re-exposure within 28 days of release from isolation

If a person meets the close contact definition within 28 days of release from isolation and is **asymptomatic,** they do not need to follow close contact requirements or undergo SARS-CoV-2 testing for screening purposes.

If they become **symptomatic,** they should follow the guidance below for *all people who develop new symptoms within 28 days of release from isolation*.

Guidance for all people who develop new symptoms within 28 days of release from isolation

To reduce the transmission of all respiratory viruses, including SARS-CoV-2, all people who develop new acute respiratory symptoms within 28 days of release from isolation should follow *recommendations to stay at home for people with acute respiratory symptoms*. This is irrespective of whether they have a known re-exposure or not.

People who are at higher risk of severe COVID-19 disease who develop new symptoms within 28 days of release from isolation should contact their health care provider for advice; testing for COVID-19 and other respiratory viruses such as influenza and respiratory syncytial virus (RSV) may be indicated.

Guidance for recovered cases more than 28 days of release from isolation

If more than 28 days have passed after release from isolation, recovered cases should be:

- tested for SARS-CoV-2 if they develop new COVID-19 symptoms and meet criteria for testing
- managed as a *case* if they test positive for SARS-CoV-2
- managed as a *close contact* if they meet the close contact definition.

7. Contacts

Close contact definition

The risk of developing COVID-19 increases with the amount of time and intimacy of contact a person has with an infectious case. People are identified as close contacts when that risk warrants public health measures to minimise the risk of further transmission.

The people at highest risk of developing COVID-19 are household and household like contacts of cases. In Australia, the ancestral strains of SARS-CoV-2 had an estimated household secondary attack rate of 22.5% (36). Estimates of household secondary attack rates vary according to the epidemiological context and VOCs *(Appendix A).*

PHUs should refer to their jurisdictional guidance for specific close contact definitions. Close contacts generally include:

- household and household like contacts
- other close contacts: in specific circumstances or where a significant transmission event has occurred, as identified by a PHU in keeping with jurisdictional protocols.

Management of contacts

While contact tracing and quarantine are effective measures against SARS-CoV-2 transmission, they are resource-intensive and disruptive to society (37). In the context of widespread community transmission, unless there is significant concern for a new VOC, close contact identification and management should be prioritised for high-risk settings. For the general population, other public health measures can be utilised as alternatives to quarantine. The duration of public health measures for close contacts should consider the *incubation period*.

PHUs should follow jurisdictional guidelines regarding the management of close contacts.

Options for management of close contacts

Public Health Measure	Possible management strategies for close contacts	When to apply
Stay at home when symptomatic	**All** close contacts should follow *recommendations to stay at home for people with acute respiratory symptoms*	Always
Testing	**Symptomatic** close contacts should get tested for SARS-CoV-2**.** **Asymptomatic** close contacts may undergo testing based on jurisdictional guidelines.	Refer to jurisdictional requirements
Quarantine	**If required**, the duration of quarantine should balance the likelihood of developing COVID-19 with the health, social and economic impacts associated with quarantine. A quarantine period of 7 days reduces transmission, with the majority of cases developing COVID-19 within 7 days from exposure (38).	Refer to jurisdictional guidance for close contact quarantine requirements.
Enhanced prevention activities	**All** people should follow *universal prevention activities.* Close contacts should also follow **additional** measures including: • Wear a mask when in an indoor setting outside of the home. • Work or study from home, where feasible. • Avoid high-risk settings. • Avoid contact with people at risk of severe illness.	Only for **asymptomatic** people where quarantine is not required Refer to jurisdictional guidance for specific information (including duration of requirements)
Communication	PHUs should stay up to date with jurisdictional advice and existing communication materials on close contact management, including translated resources. These may be used to tailor educational materials to support specific groups and develop localised communication strategies.	Always

8. List of appendices

These appendices are available through the *COVID-19 SoNG website*.

Appendix A. Current variants of concern

Appendix B. Additional guidance and resources

Appendix C. Glossary of terms

Appendix D. Full revision history

9. References

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Appendix D: Full revision history

Version	Date	Revised by	Changes
7.2	22 July 2022	CDNA	Revised: Reinfection definition
7.1	08 July 2022	CDNA	Revised: Reinfection guidance
7.0	3 June 2022	CDNA	Full revision to present evidence-based recommendations for public health in the context of widespread community transmission across Australia. Appendices have been separated from guidelines main body. Appendix A. New: Current variants of concern, Appendix B. New: Additional guidance and resources, Appendix C. New: Glossary of terms, Appendix D. Moved: Full revision history
6.7	22 March 2022	CDNA	Updated: Release from isolation, Management of contacts
6.6	02 March 2022	CDNA	Updated: Reinfection definition, Release from isolation criteria, Management of contacts
6.5	21 February 2022	CDNA	Updated: Key definitions, The Disease, Routine prevention activities, Testing, Management of contacts, Special situations, Appendices
6.4	14 January 2022	CDNA	Revisions to reflect National Cabinet decisions and AHPPC recommendations to revise test, trace, isolate and quarantine (TTIQ) in the context of high levels of COVID-19 transmission. Updated: Surveillance, Case definition, Testing, Case management, Release from isolation criteria, Close contact definition, Management of contacts
6.3	24 December 2021	CDNA	Updated: Vaccination, Surveillance, Case investigation, Release from isolation criteria, Management of contacts, Aircraft passengers and crew, Appendix B
6.2	09 December 2021	CDNA	Revisions to reflect emergence of the Omicron variant Updated: The Disease, Case definition, Genomic sequencing, Release from isolation criteria, Close contact definition, Management of contacts, Use of vaccination in outbreak situations, Appendix D (Table 4)
6.1	15 November 2021	CDNA	Updated: Release from isolation criteria
6.0	08 November 2021	CDNA	Revisions to reflect ongoing community transmission in some Australian jurisdictions and progress through the phases of the National Plan to transition Australia's National COVID-19 Response.
5.1	08 October 2021	CDNA	Revised: Contact management- Casual contacts
5.0	06 October 2021	CDNA	Inclusion of new guidance: Appendix C- Work Permissions and Restrictions Framework for workers in health care settings. Revised: Case definition, Enhanced testing, Contact management- Casual contacts
4.8	07 September 2021	CDNA	Revised: Testing, Case management, Close contact definition, Contact management
4.7	24 June 2021	CDNA	Revised: Case definition, Release from isolation criteria, Contact management
4.6	16 June 2021	CDNA	Revised: The Disease, Testing, Case Management
4.5	26 May 2021	CDNA	Inclusion of new guidance: Use of COVID-19 vaccination in outbreak situations Revised: Special situations
4.4	11 May 2021	CDNA	Inclusion of new appendix: Appendix B: Outbreak investigation and management

Version	Date	Revised by	Changes
			Revised: Summary, The Disease, Case definition, Testing, Case Management, Release from Isolation, Management of contacts, High-risk settings
4.3	03 March 2021	CDNA	Revised: The Disease, Case Definition, Testing, Case Management, Release from Isolation, Close contacts, Outbreak investigation and management in high-risk settings, Special situations, Appendix B Inclusion of new section: Appendix C
4.2	29 January 2021	CDNA	Revised: Case definition
4.1	12 January 2021	CDNA	Inclusion of new subsection: Prioritisation of whole genome sequencing for all cases Revised: Case management with inclusion of subsection detailing management of cases infected with a SARS-CoV-2 variant
4.0	23 December 2020	CDNA	Modifications to meet a setting of low prevalence of disease in Australia. Inclusion of new sections: Close contact definitions, Appendix D. Revised: The disease, Routine prevention activities, Case definition, Laboratory testing, Case management, Contact management, Outbreak investigation and management in high-risk settings, Appendix C
3.11	10 December 2020	CDNA	Revised: Summary, The disease, Case definition, Case management, Special risk settings, Appendix A
3.10	28 October 2020	CDNA	Revised: The disease, Laboratory testing, Release from isolation, Contact management, Appendices
3.9	09 October 2020	CDNA	Revised: The disease, Release from isolation, Outbreak investigation and management in high-risk settings, Special risk settings, Special situations
3.8	23 August 2020	CDNA	Revised: Modes of transmission, Release from isolation, Close contact definition – notes
3.7	12 August 2020	CDNA	Revised: Enhanced testing. Inclusion of new Special situations sub-section: Workplaces. Inclusion of new Special risk settings sub-section: Meat processing facilities
3.6	30 July 2020	CDNA	Revised: Case definition – Enhanced testing, Contact management
3.5	24 July 2020	CDNA	Inclusion of new section: Routine prevention activities. Inclusion of new Laboratory testing sub-section: Procedure for assessing indeterminate and suspected false positive SARS-CoV-2 PCR results
3.4	01 July 2020	CDNA	Revised: Case definition – suspect case, The disease, Communications, Laboratory testing, Case management, Appendix A, Appendix B, Appendix D. Minor wording changes in other sections
3.3	22 June 2020	CDNA	Revised: Case definition – enhanced testing, Case management – definition of COVID-19 death
3.2	12 June 2020	CDNA	Revised: Case definition – suspect case clinical criteria
3.1	04 June 2020	CDNA	Revised: Laboratory testing, Case management – Release from isolation, Contact management
3.0	28 May 2020	CDNA	Revised: Case definition, Case management, Appendix B. Inclusion of new section: 11. Outbreak investigation and management in high-risk settings
2.11	22 May 2020	CDNA	Revised: Case definition, Case management, Contact management

Version	Date	Revised by	Changes
2.10	13 May 2020	CDNA	Inclusion of new sections: Appendix C, Appendix D, Appendix E. Revised sections: The disease, Communications, Case definition – inclusion of serology, Laboratory testing, Case management, Contact management, Special risk settings, Special situations, Appendix A
2.9	05 May 2020	CDNA	Revised: Case definition – clinical criteria
2.8	01 May 2020	CDNA	Inclusion of new sections: Summary, The disease, Surveillance, Communications, and Data management. Revised: Case definition, Laboratory testing Case management, Contact management, Special risk settings, Special situations, Appendix A, and Appendix B
2.7	24 April 2020	CDNA	Revised: Case definition, Case management
2.6	17 April 2020	CDNA	Revised: Case management, Contact management – Close contact definition
2.5	06 April 2020	CDNA	Revised: Case definition
2.4	26 March 2020	CDNA	Inclusion of advice for probable cases throughout
2.3	24 March 2020	CDNA	Revised: Case definition
2.2	21 March 2020	CDNA	Revised: Case management – Release from isolation
2.1	20 March 2020	CDNA	Revised: Case definition, Contact management, Special situations
2.0	13 March 2020	CDNA	Revised: Case definition, Contact management, Laboratory testing, Appendix A
1.18	10 March 2020	CDNA	Revised: Case definition, Case management, Contact management. Inclusion of Aircrew and Schools advice in Special situations section
1.17	05 March 2020	CDNA	Inclusion of self-quarantine advice for returned travellers from South Korea, revised Case management, inclusion of table of contents
1.16	04 March 2020	CDNA	Inclusion of Aboriginal and Torres Strait Islander community advice in Special situations section
1.15	03 March 2020	CDNA	Revised: Case definition, Contact management
1.14	02 March 2020	CDNA	Revised: Case definition, Risk stratification of countries, Contact management
1.13	28 February 2020	CDNA	Revised: Laboratory testing, isolation and restriction and Appendix A: laboratory testing information
1.12	27 February 2020	CDNA	Inclusion of Cambodia in the list of countries in the Person under investigation section
1.11	26 February 2020	CDNA	Inclusion of Italy in the list of countries in the Person Under Investigation section
1.10	23 February 2020	CDNA	Inclusion of South Korea and Iran in the list of countries in the Person Under Investigation section
1.9	21 February 2020	CDNA	Revised: case definition, infectious period, contact management, special situation (cruise ship). Specific changes are highlighted
1.8	17 February 2020	CDNA	Inclusion of statement reflecting that passengers of the Diamond Princess cruise meet the criteria for close contact
1.7	15 February 2020	CDNA	Revised case definition
1.6	14 February 2020	CDNA	Addition of Appendix B: Interim recommendations for the use of personal protective equipment (PPE) during hospital care of people with Coronavirus Disease 2019 (COVID-19). Updated nomenclature
1.5	07 February 2020	CDNA	Inclusion of advice on release from isolation
1.4	06 February 2020	CDNA	Revised case definition and added rationale. Updated infection control advice throughout

Version	Date	Revised by	Changes
1.3	04 February 2020	CDNA	Revised the case definition and use of the terms ‘quarantine’ and ‘isolation’
1.2	02 February 2020	CDNA	Revised the case definition, close and casual contact definitions and added self-isolation guidance
1.1	27 January 2020	CDNA	Removed references to Wuhan and revised the case definition
1.0	23 January 2020	CDNA	Developed by the 2019-nCoV Working Group