



The Department of Health and Ageing acknowledges the providers of the many sources of data used in this report and greatly appreciates their contribution.

Key Indicators

Influenza activity and severity in the community is monitored using the following indicators and surveillance systems:

Is the situation changing?	Indicated by trends in: <ul style="list-style-type: none"> laboratory confirmed cases reported to the National Notifiable Diseases Surveillance System; GP Sentinel influenza-like illness (ILI) Surveillance; emergency department (ED) presentations for ILI; ILI-related absenteeism and call centre calls; and sentinel laboratory test results.
How severe is the disease, and is severity changing?	Indicated by trends in: <ul style="list-style-type: none"> hospitalisations, ICU admissions and deaths from sentinel systems; and clinical severity in hospitalised cases and ICU admissions.
Is the virus changing?	Indicated by trends in: <ul style="list-style-type: none"> drug resistance; and genetic drift or shift from laboratory surveillance.

Summary

- Levels of influenza-like illness (ILI) in the community have started to decrease through both sentinel general practitioner surveillance systems and ILI presentations to emergency departments.
- Notifications have continued to be highest in Queensland and South Australia, with New South Wales also still high. Notifications are decreasing across most states and territories, however notifications in the Northern Territory, South Australia, Victoria and Western Australia appear to have plateaued.
- During this fortnight there were 1,958 laboratory confirmed notifications of influenza, with Queensland reporting the highest number of notifications, followed by South Australia. Nationally, the majority of virus detections have been pandemic (H1N1) 2009, with co-circulation of influenza B.
- In the Northern Territory this fortnight notifications of influenza A/H3N2 represented 75% of their notifications, and nationally the majority of A/H3N2 notifications are being reported from the Northern Territory and Western Australia. In Tasmania and more recently New South Wales, influenza B continues to be the dominant strain.
- As at 16 September 2011, there have been 22,303 confirmed cases of influenza reported to the National Notifiable Diseases Surveillance System (NNDSS) in 2011. Nationally, weekly notifications for this season have peaked. This season's peak appears to have occurred in the week ending 5 August 2011 with 1,976 influenza notifications, and was above the peak frequency experienced in previous years, except 2009.
- The WHO has reported that influenza activity in the temperate regions of the northern hemisphere remains low. Influenza transmission continues to occur in a few countries of the tropical region. In New Zealand, rates of national ILI consultations are currently consistent with baseline activity levels, and influenza type B and A/H3N2 are currently the predominant strains circulating.

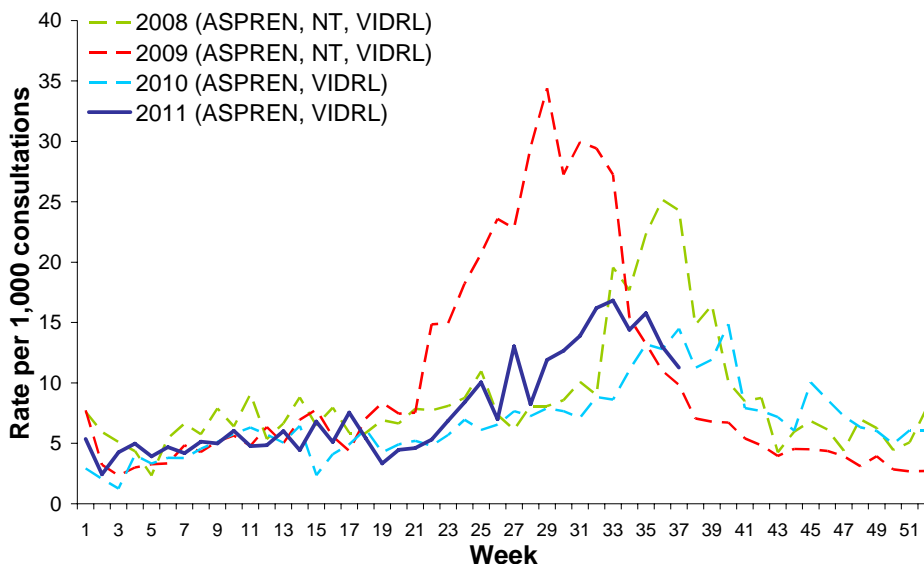
1. Influenza activity in Australia

Influenza-Like Illness

Sentinel General Practice Surveillance

Sentinel general practitioner ILI consultation rates have remained relatively stable in recent weeks. In the week ending 11 September 2011, the national ILI consultation rate to sentinel GPs was 11 cases per 1,000 consultations, down from 16 cases per 1,000 in the previous fortnight (Figure 1).

Figure 1. Weekly rate of ILI reported from GP ILI surveillance systems from 1 January 2008 to 11 September 2011*



* Delays in the reporting of data may cause data to change retrospectively. As data from the VIDRL surveillance system is combined with ASPREN data for 2010 and 2011, rates may not be directly comparable across 2008 and 2009.

SOURCE: ASPREN and VIDRL GP surveillance system¹.

In the fortnight ending 11 September 2011, specimens were collected from just over half of ASPREN ILI patients. Of these patients, 44 specimens (29%) were positive for influenza, which is a slight decrease from the previous fortnight. Twenty-five specimens were typed as influenza type A, and were mostly pandemic (H1N1) 2009; and the remainder (19) were influenza type B. Forty-eight specimens were positive for other respiratory viruses, with the majority of these being rhinovirus (18) and parainfluenza virus type 3 (13) (Table 1).

Table 1. ASPREN ILI consultations laboratory respiratory viral tests that were positive for influenza or other respiratory virus, 1 January 2011 to 11 September 2011.

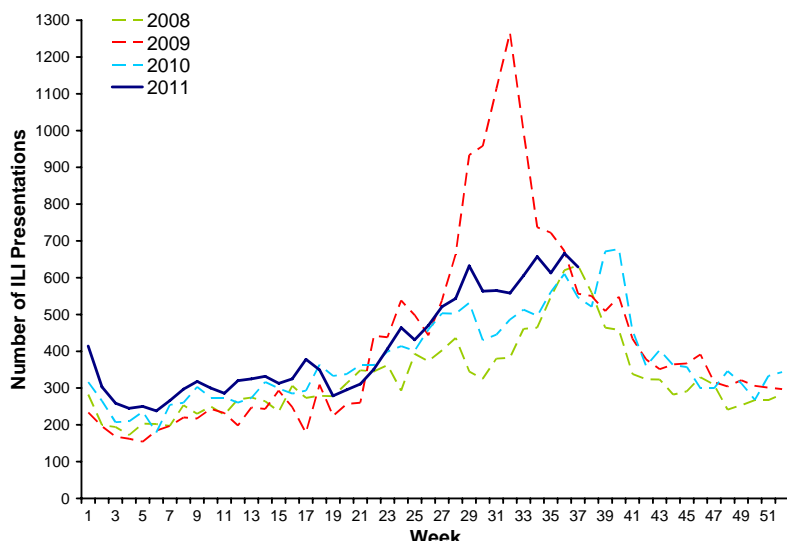
	ASPREN Fortnight (29 August to 11 September 2011)	ASPREN YTD (1 January – 11 September 2011)
Total specimens tested	150	1407
Total Influenza Positive	44	399
Influenza A	25	254
<i>Pandemic (H1N1) 2009</i>	15	193
<i>Seasonal A/H3N2</i>	6	25
<i>Influenza A untyped</i>	4	36
Influenza B	19	145
Total Positive other Resp. Viruses*	48	391

* Other respiratory viruses include RSV, para-influenza, adenovirus and rhinovirus.

Western Australia Emergency Departments

In the fortnight ending 11 September 2011, respiratory viral presentations to WA EDs increased compared to the previous fortnight, and presentations remain well above baseline levels. Over this period there were 1,295 presentations, including 88 admissions (Figure 2). The proportion of presentations admitted to hospital over this period remained relatively stable and represented 7% of presentations.

Figure 2. Number of respiratory viral presentations to WA EDs from 1 January 2008 to 11 September 2011, by week

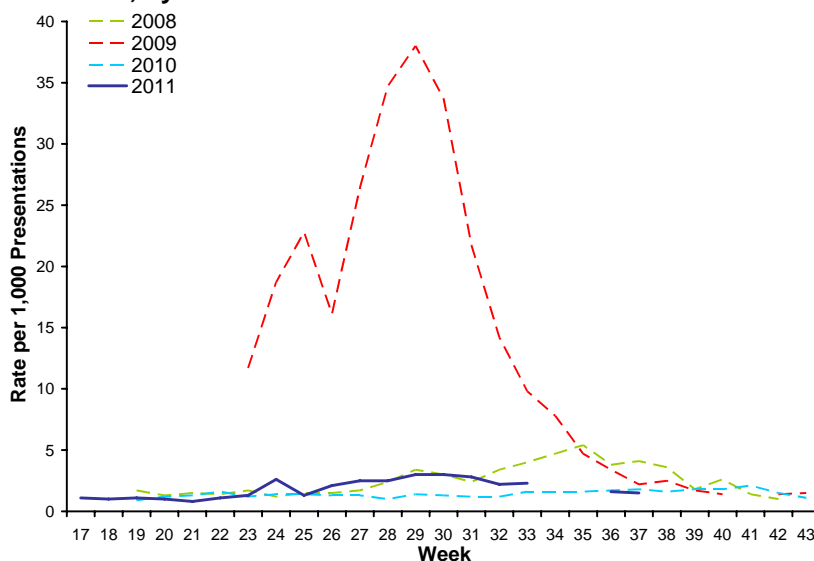


Source: WA 'Virus Watch' Report²

New South Wales Emergency Departments

In the week ending 16 September 2011 the number of patients presenting to NSW EDs with ILI continued to decrease and activity was reported as being low for this time of year (Figure 3). Around two-thirds of ILI presentations were reported in people aged 15 to 44 years (64%). Total admissions to critical care units for ILI and pneumonia was similar to the previous week, and remained within the usual range for this time of year.³

Figure 3. Rate of influenza-like illness presentations to NSW Emergency Departments between May and October, 2008 to 2011, by week*



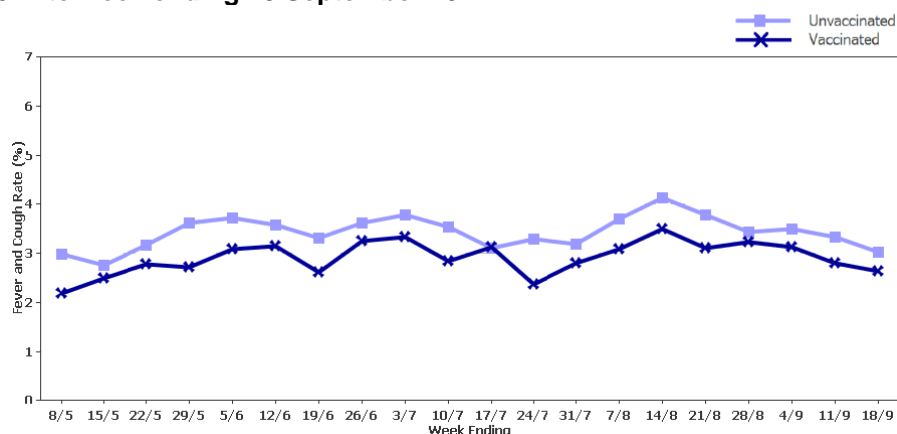
Source: NSW Influenza Weekly Epidemiology Report³
*Data missing for weeks 34 and 35

FluTracking

FluTracking, a national online system for collecting data on ILI in the community, noted that in the week ending 18 September 2011 fever and cough was reported by 2.6% of vaccinated participants and 3.0% of unvaccinated participants (Figure 4).⁴ Fever, cough and absence from normal duties was reported by 1.6% of vaccinated participants and 1.6% of unvaccinated participants. Rates of ILI among FluTracking participants has remained relatively stable this season, compared to previous years (Figure 5).

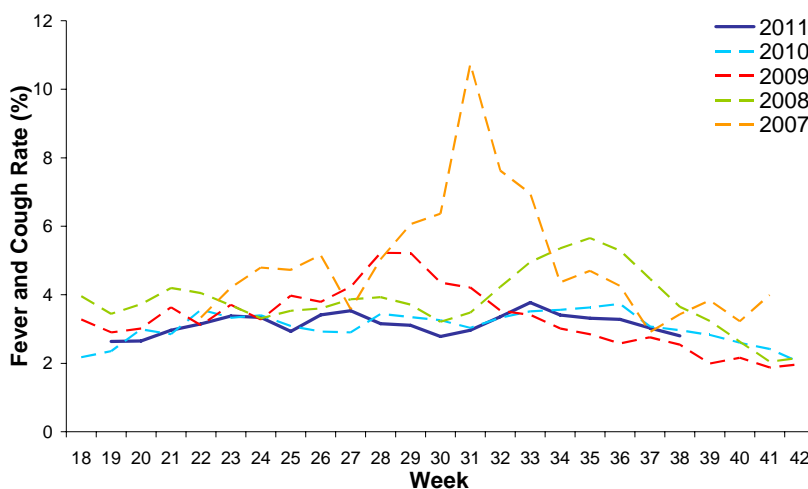
Up to 18 September 2011, 5,619 out of 10,069 (55.8%) participants reported having received the seasonal vaccine so far. Of the 2,320 participants who identified as working face-to-face with patients, 1,702 (73.4%) have received the vaccine.

Figure 4. Rate of ILI symptoms among FluTracking participants by week, from week ending 8 May 2011 to week ending 18 September 2011.



Source: FluTracking⁴

Figure 5. Rate of fever and cough among FluTracking participants by week, between May and October, 2007 to 2011.



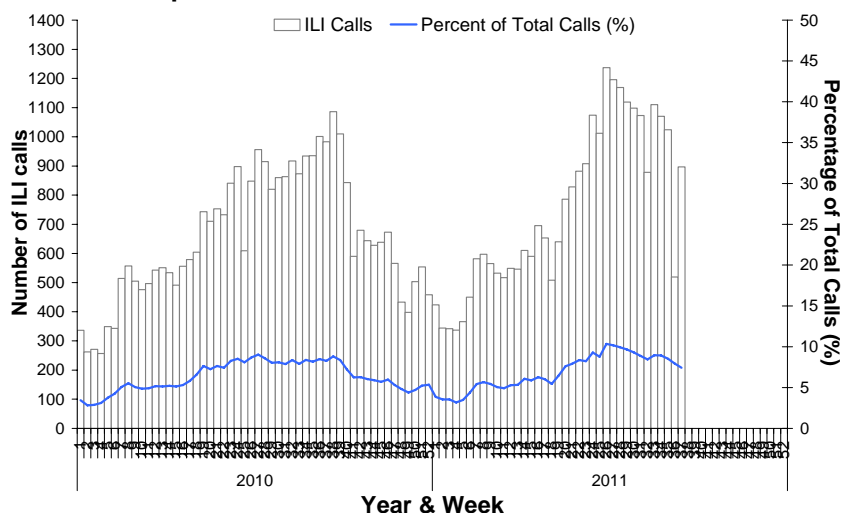
Source: FluTracking⁴

In regard to Figure 5, FluTracking investigators found that at the community level, peak ILI levels for 2007 were higher than 2009. This finding was consistent with other surveillance systems measuring ILI at the community level, with ASPREN showing similar levels of peak ILI in 2007 and 2009; Google flu trends showed higher levels of ILI at the peak in 2007 as compared to 2009; and workplace absenteeism showed slightly higher peak levels of ILI in 2007 than 2009. FluTracking data are consistent with NSW mortality data for influenza and pneumonia. Although laboratory data and emergency department (ED) data showed higher peak levels of influenza in 2009 than 2007, FluTracking found that the laboratory data were biased by increased testing in 2009 and ED data were biased by increased health seeking behaviour during the pandemic. See: <http://wwwnc.cdc.gov/eid/article/16/12/10-0935-f1.htm>

National Health Call Centre Network

The number of ILI-related calls to the National Health Call Centre Network (NHCCN) decreased compared to the previous fortnight. The percentage of total calls also decreased and in the week ending 18 September 2011 7% of calls to the NHCCN were ILI related, which is slightly less than the same period in 2010 (Figure 6).

Figure 6. Number of calls to the NHCCN related to ILI and percentage of total calls, Australia, 1 January 2010 to 18 September 2011



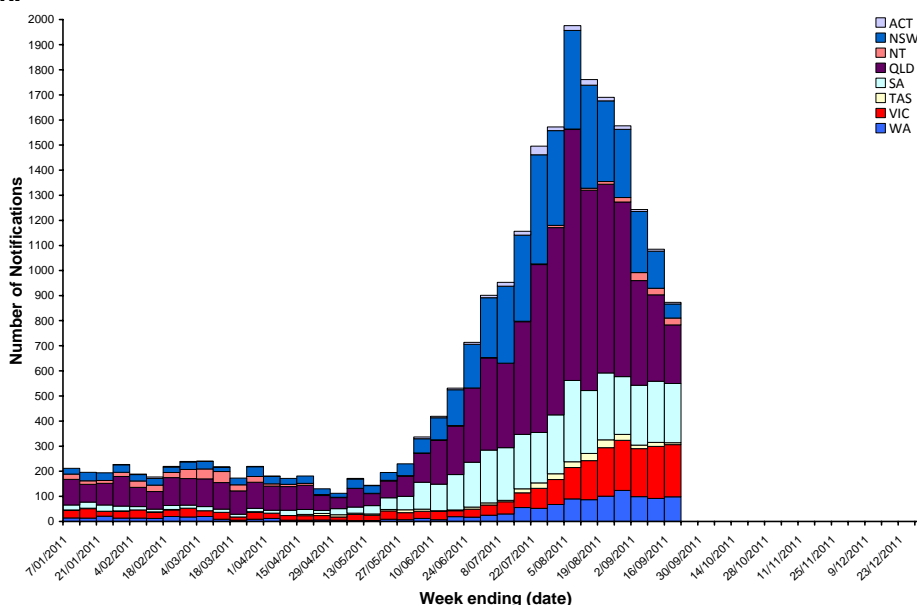
Note: National data do not include QLD and VIC
Source: NHCCN data

Laboratory Confirmed Influenza

Laboratory Confirmed Cases Notified to Health Departments

During this reporting period there were 1,958 laboratory confirmed influenza notifications reported to the NNDSS. Of these notifications, there were 577 in Qld, 480 in SA, 415 in Vic, 204 in NSW, 190 in WA, 54 in the NT, 24 in TAS, and 14 in the ACT (Figure 7). A weekly breakdown of trends by state and territory highlights that notifications have continued to be highest in Queensland and South Australia, with New South Wales also still high. Notifications are decreasing across most states and territories, however notifications in the Northern Territory, South Australia, Victoria and Western Australia appear to have plateaued (Figure 9).

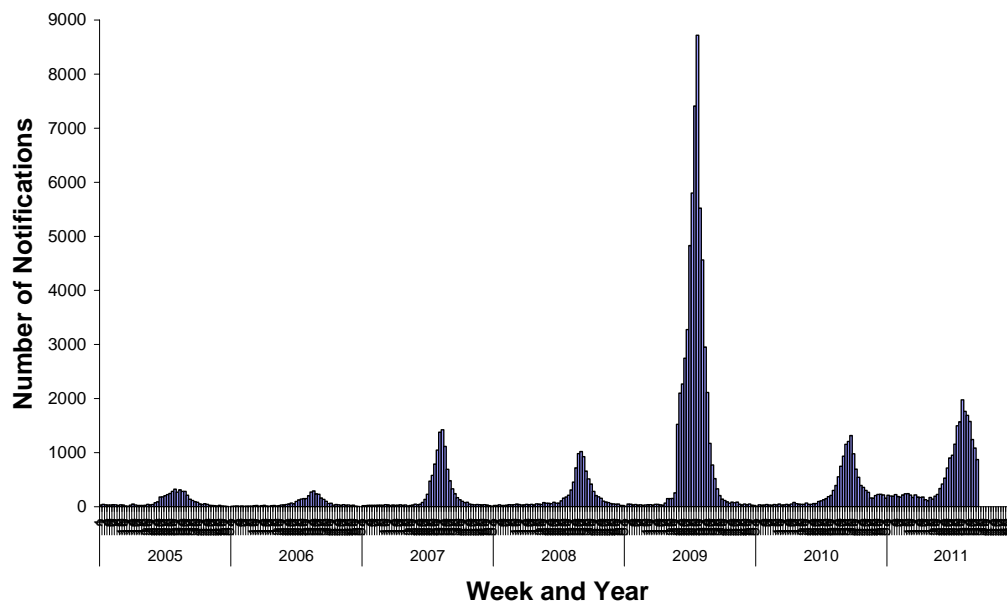
Figure 7. Laboratory confirmed cases of influenza in Australia, 1 January to 16 September 2011, by state, by week.



Source: NNDSS 2011

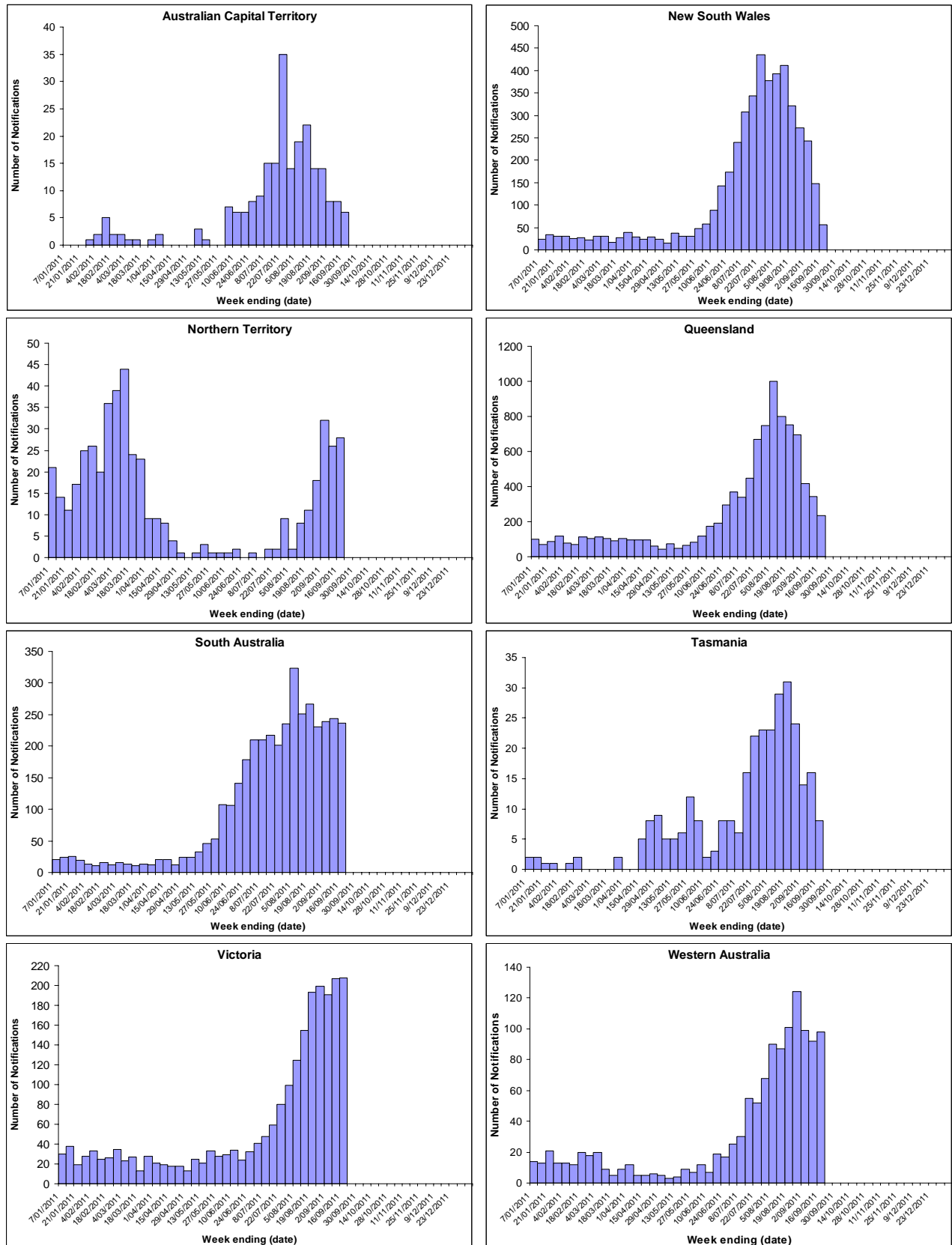
Up to 16 September, there have been 22,303 laboratory confirmed notifications of influenza diagnosed during 2011 (Figure 8). Of these notifications, there have been 9,404 notified in Qld, 4,612 in NSW, 3,835 in SA, 2,245 in Vic, 1,199 in WA, 479 in the NT, 302 in Tas and 227 in the ACT. Nationally weekly notifications for this season have peaked. This season's peak appears to have occurred in the week ending 5 August 2011 with 1,976 influenza notifications, and was above the peak frequency experienced in previous years, except 2009. Over the summer months, all jurisdictions reported higher than usual numbers of notifications, especially in the Northern Territory and Queensland. The reason for this unusually high activity is not clear, but it does not appear to be due solely to increased testing.

Figure 8. Laboratory confirmed cases of influenza in Australia, 1 January 2005 to 16 September 2011



Source: NNDSS 2011

Figure 9. State breakdowns of laboratory confirmed cases of influenza, 1 January to 16 September 2011, by week



Source: NNDSS 2011

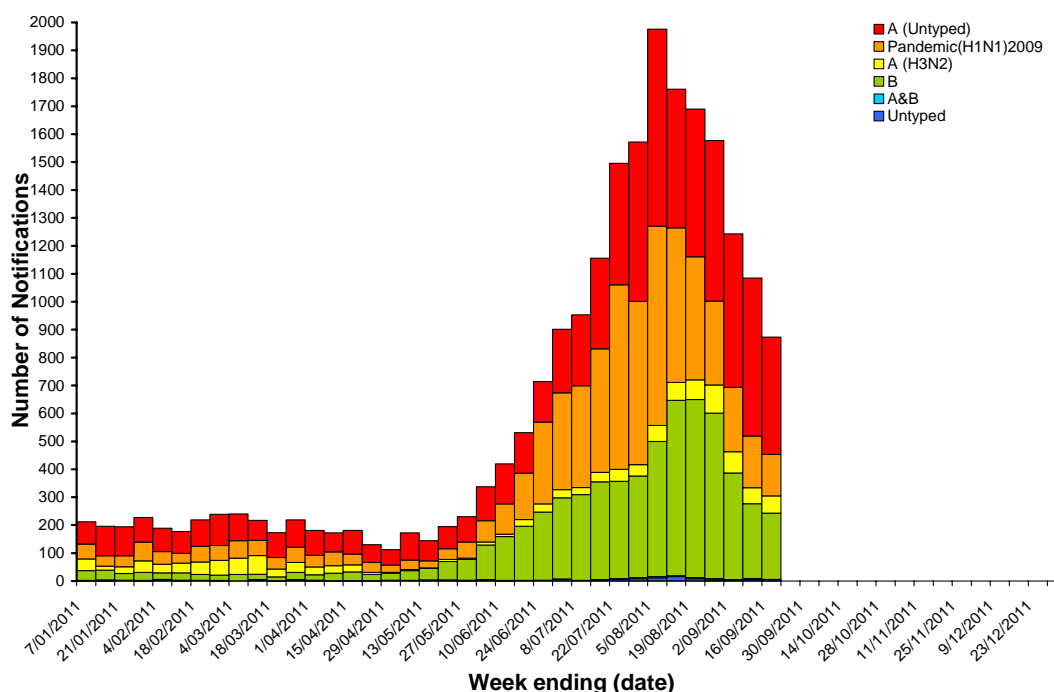
Of the 1,958 influenza notifications reported to the NNDSS this reporting period, 1,438 were influenza A (986 were influenza A (untyped), 333 were pandemic (H1N1) 2009 and 119 were A/H3N2), 505 were influenza B, 4 were influenza A&B and 11 notifications were reported as untyped (Figure 10). Nationally, compared to the beginning of the year, there is little A/H3N2 circulating.

The majority of states and territories have reported mostly pandemic (H1N1) 2009, with co-circulation of influenza B. However, in the Northern Territory this fortnight notifications of influenza A/H3N2 represent 75% of their notifications, and nationally the majority of A/H3N2 notifications are being reported from the Northern Territory and Western Australia. In Tasmania and more recently New South Wales, influenza B continues to be the dominant strain.

So far in 2011, 15,880 (71%) cases were reported as influenza A (36% influenza A (untyped), 29% pandemic (H1N1) 2009 and 6% A/H3N2) and 6,245 (28%) were influenza B. A further 66 (<1%) were influenza type A&B and 112 (<1%) were untyped (Figure 10).

Note: Northern Territory sub-typing results reported to the NNDSS as "Influenza A/Not Pandemic" have been counted as influenza A/H3N2 notifications.

Figure 10. Laboratory confirmed cases of influenza in Australia, 1 January 2011 to 16 September 2011, by sub-type and week



Source: NNDSS 2011

Sentinel Laboratory Surveillance

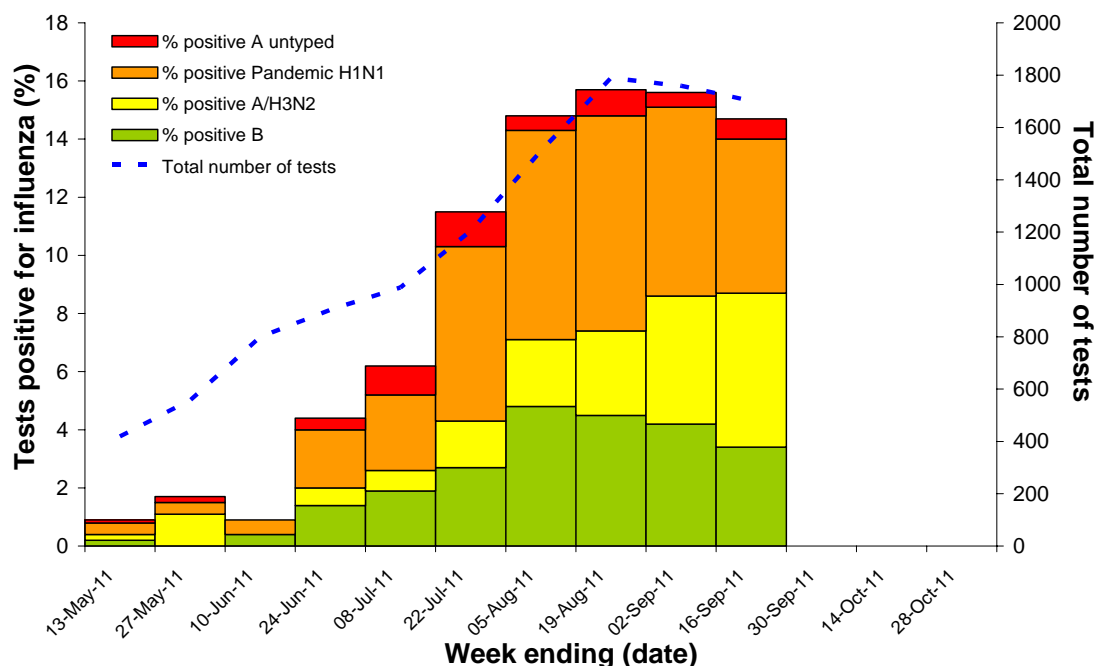
Results from sentinel laboratory surveillance systems for this reporting period show that 14.6% (249/1,701) of the respiratory viral tests conducted over this period were positive for influenza (Table 2). Positive influenza specimens were reported from all sentinel laboratories. The proportion of A/H3N2 reported through sentinel laboratory surveillance systems have continued to increase this fortnight.

Table 2. Sentinel laboratory respiratory virus testing results, 3 September to 16 September 2011

	NSW NIC	WA NIC	NT (Reported by WA NIC)	VIC NIC	TAS PCR Testing Data
Total specimens tested	412	842	5	315	127
Total Influenza Positive	18	137	2	72	20
Positive Influenza A	11	121	2	49	9
<i>Pandemic (H1N1) 2009</i>	<i>0</i>	<i>80</i>	<i>0</i>	<i>5</i>	<i>5</i>
<i>A/H3N2</i>	<i>5</i>	<i>40</i>	<i>2</i>	<i>41</i>	<i>2</i>
<i>Influenza A untyped</i>	<i>6</i>	<i>1</i>	<i>0</i>	<i>3</i>	<i>2</i>
Positive Influenza B	7	16	0	23	11
The most common respiratory virus detected	Rhinovirus	Influenza A	-	Influenza A	RSV & Rhinovirus

Since the fortnight ending 30 April 2011, a total of 11.2% of specimens have been positive for influenza. A breakdown of subtypes within this positive proportion by fortnight is highlighted in Figure 11.

Figure 11. Proportion of sentinel laboratory* tests positive for influenza, by subtype and fortnight, 30 April to 16 September 2011.



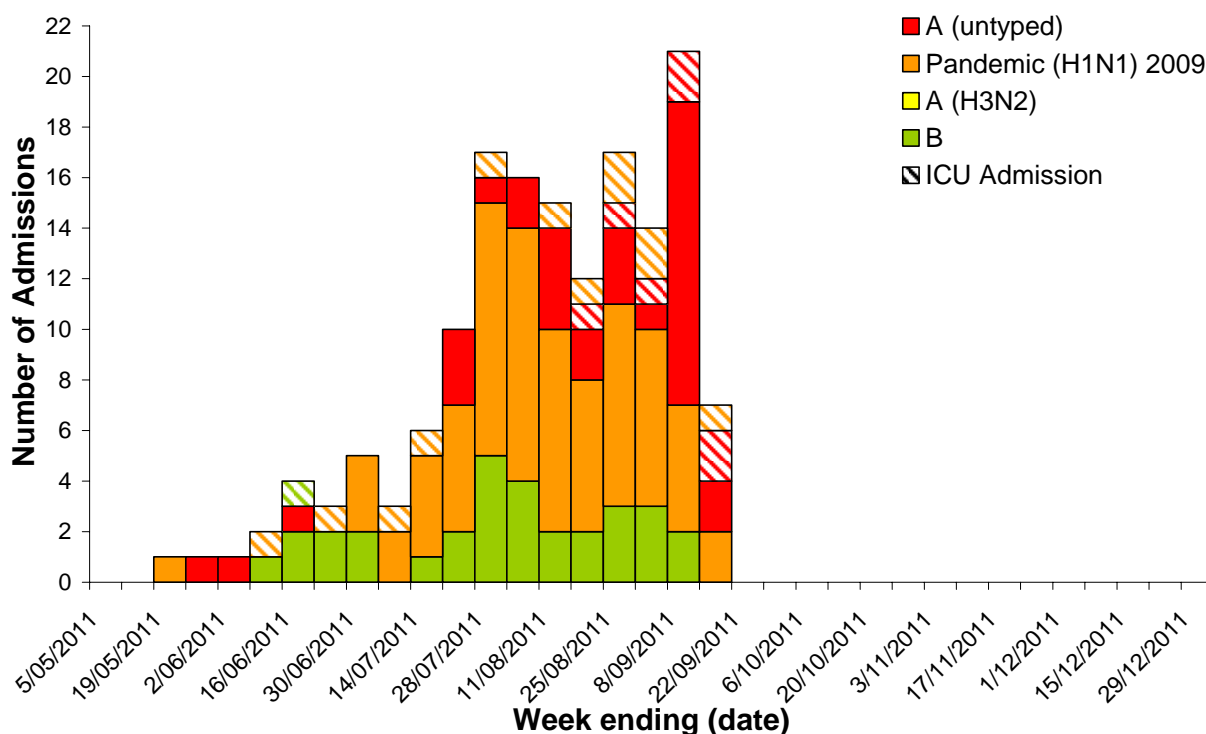
* Tasmanian PCR testing data included from 9 July 2011

Influenza Hospitalisations

Influenza Complications Alert Network (FluCAN) – Victoria and the Australian Capital Territory

The Influenza Complications Alert Network (FluCAN) sentinel hospital system in Victoria, South Australia, Western Australia and the ACT has reported 155 hospitalisations, including 20 ICU admissions, associated with influenza since 1 May 2011 (Figure 12). Over half (53%) of the hospitalisations and 60% of ICU admissions have been associated with pandemic (H1N1) 2009 infection. The mean age of patients hospitalised has been 49 years.

Figure 12. Number of influenza hospitalisations at sentinel hospitals, Victoria, South Australia, Western Australia and the ACT, by week and influenza subtype, 1 May to 15 September 2011



Source: FluCAN Sentinel Hospitals

Australian Paediatric Surveillance

The Australian Paediatric Surveillance Unit (APSU) conducts seasonal surveillance of children aged 15 years and under who are hospitalised with severe complications of influenza. Between 1 July and 20 September 2011, there have been 36 hospitalisations associated with severe influenza complications in children, including 17 ICU admissions. The majority of these hospitalisations were associated with pandemic (H1N1) 2009 infection. Of the 28 hospitalisations with completed questionnaires, 10 were noted as having underlying chronic medical conditions. *Please note hospitalisation numbers may change over time due to case reviews.*

Deaths associated with influenza and pneumonia

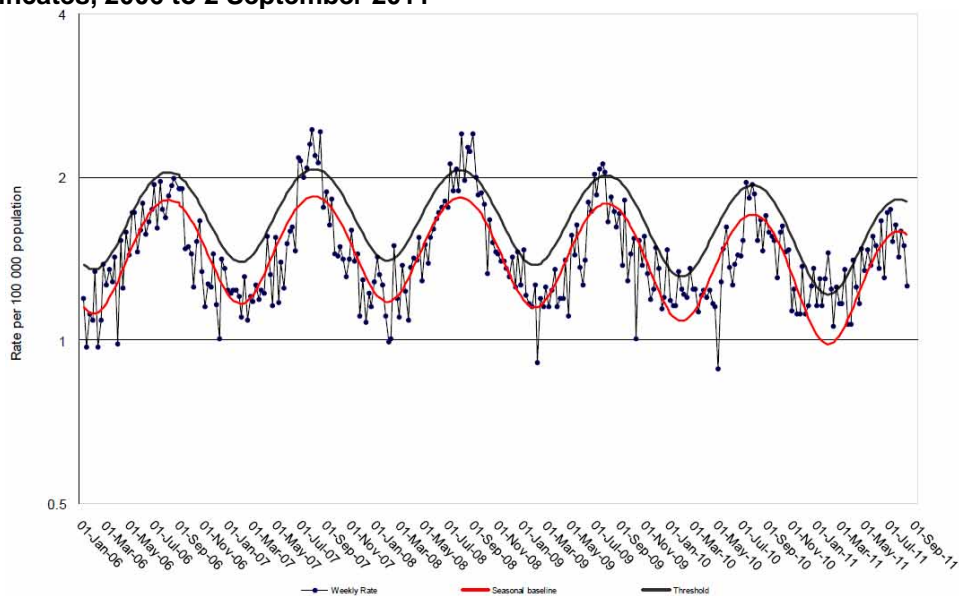
Nationally Notified Influenza Associated Deaths

In 2011, 14 influenza associated deaths have been notified to the NNDSS, with a median age of 47 years. Ten of these cases were reported as having a pandemic (H1N1) 2009 infection, two with influenza type B and the other case reported as having influenza type A (untyped).

New South Wales Influenza and Pneumonia Death Registrations

Death registration data up to 2 September 2011 showed that there were 1.2 pneumonia or influenza associated deaths per 100,000 population in NSW, which is below the seasonal threshold of 1.8 per 100,000 NSW population for this period (Figure 13).³

Figure 13. Rate of deaths classified as influenza and pneumonia from the NSW Registered Death Certificates, 2006 to 2 September 2011



Source: NSW 'Influenza Weekly Epidemiology Report'³

2. Virology

Typing and antigenic characterisation

WHO Collaborating Centre for Reference & Research on Influenza (WHO CC) in Melbourne

From 1 January to 4 September 2011, there were 1,763 Australian influenza isolates subtyped by the WHO CC with half of these isolates subtyped as pandemic (H1N1) 2009 (Table 3).

Table 3. Typing of influenza isolates from the WHO Collaborating Centre, from 1 January 2011 to 18 September 2011

Type/Subtype	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	TOTAL
Pandemic (H1N1) 2009	9	337	32	308	58	22	87	29	882
A(H3N2)	1	17	48	137	19	7	46	12	287
B	1	109	37	105	220	10	107	5	594
Total	11	463	117	550	297	39	240	46	1,763

SOURCE: WHO CC

Please note: There may be up to a month delay on reporting of samples.
Isolates tested by the WHO CC are not necessarily a random sample of all those in the community.

Recent analysis of the low reactor pandemic (H1N1) 2009 strains has shown that about 40% have a particular change in the haemagglutinin sequence, which is known to affect antigenicity and to be associated with adaptation to growth in mammalian cell lines. Other low-reactor pandemic (H1N1) 2009 viruses analysed at the WHO CC in 2011 have been genetically diverse. Overall the data do not point to the emergence of a distinct group of antigenic drift variants.

Antiviral Resistance

The WHO Collaborating Centre in Melbourne has reported that from 1 January to 18 September 2011, 15 influenza viral isolates (out of 1,649 tested) have shown resistance to the neuraminidase inhibitor oseltamivir by enzyme inhibition assay (EIA). A further 18 specimens, out of a total of 203 tested by pyrosequencing, have shown the H275Y mutation known to confer resistance to oseltamivir. A total of 33 influenza viruses have shown resistance to oseltamivir in 2011, all have been the pandemic (H1N1) 2009 subtype.

The recent increases in oseltamivir resistance in pandemic (H1N1) 2009 influenza isolates have predominately occurred in the Hunter New England region of New South Wales between June and August 2011. The cluster consists of 29 cases, of which 6 were hospitalised and three were pregnant. A further two oseltamivir-resistant pandemic (H1N1) 2009 viruses, sampled in July and August, have also been found to belong to the cluster. Both of these cases were detected outside the Hunter New England region with no recent travel history to this region. Only one of the cases reported so far were treated with oseltamivir prior to their positive test for influenza, however this was case not the earliest known cases in the cluster. All of the viruses are sensitive to zanamivir and have not shown any antigenic changes that would affect their recognition by vaccine-induced antibodies.

3. International Influenza Surveillance

The WHO⁵ has reported that as at 23 September 2011 influenza activity in the temperate regions of the northern hemisphere remains low or undetectable. In the tropical zone, influenza activity is mostly reported as low, with some ongoing transmission reported in countries of the Americas (Cuba, Honduras and Bolivia); western Africa (Cameroon); and southern Asia (India, Thailand, Vietnam and Singapore). Influenza transmission in South Africa has declined low levels, after peaking in early to mid June.

In New Zealand⁶, for the week ending 18 September 2011, the national rate of ILI consultations are currently consistent with baseline activity levels with 7 of the twenty district health boards above the national average weekly consultation rate. Influenza type B and A/H3N2 are the predominant strains currently circulating in New Zealand.

National Influenza Centres in 69 countries have reported that for the period 28 August to 10 September 2011, a total of 1,023 specimens were reported as positive for influenza viruses, 745 (73%) were typed as influenza A and 278 (27%) as influenza B. Of the sub-typed influenza A viruses reported, 43% were pandemic (H1N1)2009 and 57% were influenza A(H3N2)⁷.

WHO have released a summary review of the northern hemisphere winter influenza season⁸. The summary review notes that the most commonly detected virus was different in North America, where influenza A(H3N2) and influenza type B co-circulated with pandemic (H1N1) 2009, and Europe, where influenza A(H1N1)2009 was by far the most commonly detected virus. Although it was no longer the predominant influenza virus circulating in many parts of the world, pandemic (H1N1) 2009 otherwise behaved much the same way as it had during the pandemic in terms of the age groups most affected and the clinical pattern of illness. More than 90% of viruses detected around the world during the northern hemisphere influenza season were similar antigenically to those found in the seasonal trivalent influenza vaccine. Antiviral resistance in pandemic (H1N1)2009 remained at a very low level.

The WHO has released their recommendation for the antigen composition of 2011-2012 northern hemisphere influenza season trivalent flu vaccine⁹. It is recommended that vaccines contain the following:

- an A/California/7/2009 (H1N1)-like virus;
- an A/Perth/16/2009 (H3N2)-like virus;
- a B/Brisbane/60/2008-like virus.

This recommended composition is the same as the 2010-2011 Northern Hemisphere and the 2011 Southern Hemisphere vaccine compositions.

4. Data considerations

The information in this report is reliant on the surveillance sources available to the Department of Health and Ageing. As access to sources increase as the season progresses, this report will be updated with the additional information.

This report aims to increase awareness of pandemic (H1N1) 2009 and seasonal influenza in Australia by providing an analysis of the various surveillance data sources throughout Australia. While every care has been taken in preparing this report, the Commonwealth does not accept liability for any injury or loss or damage arising from the use of, or reliance upon, the content of the report. Delays in the reporting of data may cause data to change retrospectively. For further details about information contained in this report please contact the Influenza Surveillance Team through flu@health.gov.au.

Sentinel General Practice Surveillance

The Australian Sentinel Practices Research Network (ASPREN) has Sentinel GPs who report ILI presentation rates in NSW, NT, SA, ACT, VIC, QLD, TAS and WA. As jurisdictions joined ASPREN at different times and the number of GPs reporting has changed over time, the representativeness of ASPREN data in 2011 may be different from that of previous years. ASPREN data and VIDRL influenza surveillance data are sent to the Department on a weekly basis. Approximately 30% of all ILI patients presenting to ASPREN sentinel GPs are swabbed for laboratory testing. Please note the results of ASPREN ILI laboratory respiratory viral tests now include Western Australia.

Further information on Sentinel GPs' Influenza Surveillance and ASPREN activities are available at www.dmac.adelaide.edu.au/aspren.

Sentinel Emergency Department Data

WA - ED surveillance data are extracted from the 'Virus Watch' Report. This report is provided weekly. The Western Australia Influenza Surveillance Program collects data from eight Perth EDs.

NSW - ED surveillance data are extracted from the 'Weekly Influenza Report, NSW'. The New South Wales Influenza Surveillance Program collects data from 56 EDs across New South Wales.

FluTracking

FluTracking is a project of the University of Newcastle, the Hunter New England Area Health Service and the Hunter Medical Research Institute. FluTracking is an online health surveillance system to detect epidemics of influenza. It involves participants from around Australia completing a simple online weekly survey, which collects data on the rate of ILI symptoms in communities.

Further information on FluTracking is available at www.flutracking.net/index.html.

FluTracking investigators found that at the community level, peak ILI levels for 2007 were higher than 2009. This finding was consistent with other surveillance systems measuring ILI at the community level, with ASPREN showing similar levels of peak ILI in 2007 and 2009; Google flu trends showed higher levels of ILI at the peak in 2007 as compared to 2009; and workplace absenteeism showed slightly higher peak levels of ILI in 2007 than 2009. FluTracking data are consistent with NSW mortality data for influenza and pneumonia. Although laboratory data and emergency department (ED) data showed higher peak levels of influenza in 2009 than 2007, FluTracking found that the laboratory data were biased by increased testing in 2009 and ED data were biased by increased health seeking behaviour during the pandemic. See:

<http://wwwnc.cdc.gov/eid/article/16/12/10-0935-f1.htm>

National Notifiable Diseases Surveillance System (NNDSS)

Laboratory confirmed influenza (all types) is notifiable under public health legislation in all jurisdictions in Australia. Confirmed cases of influenza are notified through the NNDSS by all jurisdictions. The national case definition is available at: http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-ndss-casedefs-cd_flu.htm.

Analyses of Australian cases are based on the diagnosis date, which is the earliest of the onset date, specimen date or notification date.

Sentinel Laboratory Surveillance data

Laboratory testing data are provided weekly directly from PathWest (WA), VIDRL (VIC), ICPMR (NSW), Tasmanian laboratories reporting PCR results, and ASPREN (national).

Influenza Complications Alert Network (FluCAN)

The Influenza Complications Alert Network (FluCAN) sentinel hospital system monitors influenza hospitalisations at the following sites:

- Victoria – Geelong Hospital, Royal Melbourne Hospital, Monash Medical Centre and Alfred Hospital;
- Australian Capital Territory – Canberra Hospital and Calvary Hospital;
- South Australia – Royal Adelaide Hospital;
- Western Australia – Royal Perth Hospital.

Influenza counts are based on active surveillance at each site for admissions with PCR-confirmed influenza in adults. Some adjustments may be made in previous periods as test results become available. ICU status is as determined at the time of admission and does not include patients subsequently transferred to ICU.

Australian Paediatric Surveillance Unit

The Australian Paediatric Surveillance Unit (APSU) conducts seasonal surveillance of children aged 15 years and under who are hospitalised with severe complications of influenza. Reports are collated on a weekly basis from approximately 1,300 paediatricians and other child health clinicians around Australia. The protocol and case definition is available at:

<http://www.apsu.org.au/download.cfm?DownloadFile=96DE7B48-0CC2-E99A-525BCD4BD6A2CB80>.

WHO Collaborating Centre for Reference & Research on Influenza (WHO CC)

Data are provided weekly to the Health Protection and Surveillance Branch from the WHO CC.

Deaths associated with influenza and pneumonia

Nationally reported influenza associated deaths are notified by jurisdictions to the NNDSS which is maintained by the Department of Health and Ageing. However these are an underestimation of the true number of deaths occurring in the community associated with influenza.

NSW influenza and pneumonia deaths data are collected from the NSW Registry of Births, Deaths and Marriages. Figure 13 is extracted from the 'Weekly Influenza Report, NSW'. NSW Registered Death Certificates are routinely reviewed for deaths attributed to pneumonia or influenza. While pneumonia has many causes, a well-known indicator of seasonal and pandemic influenza activity is an increase in the number of death certificates that mention pneumonia or influenza as a cause of death. The predicted seasonal baseline estimates the predicted rate of influenza or pneumonia deaths in the absence of influenza epidemics. If deaths exceed the epidemic threshold, then it may be an indication that influenza is beginning to circulate widely.

5. References

- 1 The 2011 Victorian Influenza Vaccine Effectiveness Audit Report #19, 11 September 2011. Available from: www.victorianflusurveillance.com.au. Accessed 22 September 2011.
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- 6 New Zealand Influenza Weekly Update, Week Ending 18 September 2011. Available from: http://www.surv.esr.cri.nz/virology/influenza_weekly_update.php, Accessed 26 September 2011.
 - 7 WHO Laboratory confirmed data from the Global Influenza Surveillance Network – 23 September 2011. Available from: http://www.who.int/influenza/surveillance_monitoring/updates/latest_update_GIP_surveillance/en/index.html. Accessed 26 September 2011.
 - 8 WHO Summary review of the 2010-2011 northern hemisphere winter influenza season. Available from: http://www.who.int/influenza/surveillance_monitoring/2010_2011_GIP_surveillance_seasonal_review/en/index.html. Accessed 16 June 2011.
 - 9 WHO Recommended composition of influenza virus vaccines for use in the 2011-2012 northern hemisphere influenza season. Available from: http://www.who.int/influenza/vaccines/virus/2011_12north/en/index.html. Accessed 3 June 2011.