Australian Government
Department of Health

INFORMATION BRIEF
Updated on 22 November 2017

2017 Influenza Season in Australia

A summary from the National Influenza Surveillance Committee

SUMMARY

- While there was geographic variation across Australia, in general the 2017 influenza season saw the highest levels of activity since the 2009 pandemic year.
- In the most populous eastern states the season began approximately one month earlier and activity at the peak was more prolonged than during the previous 5 years. In contrast, activity in the western half of the continent was comparable to recent seasons, though the peak was later than usual.
- The impacts of the season included high levels of absenteeism and a substantial burden on primary care and hospitals.
- The severity of infection in people hospitalised with influenza was on the low end of the 5 year historic range.
- While an increased number of deaths have been reported in 2017, mortality is consistent with recent years when taking into account the significant increase in notifications of laboratory confirmed influenza. Most of the deaths have occurred in the elderly, which is consistent with years when influenza A(H3N2) circulates.
- Influenza A(H3N2) predominated nationally, accounting for an estimated 55% of notified laboratory confirmed cases of influenza for the year to date. Influenza A(H3N2) also contributed to the high number of cases among the elderly. Influenza B co-circulated (37% of laboratory confirmed cases nationally year to date), and affected all ages groups, but particularly school aged children.
- The effectiveness of the 2017 seasonal influenza vaccine against presenting to a General Practitioner (GP) was preliminarily estimated to be low overall (33%), and lower against hospitalisation overall (16%). The overall effectiveness was skewed due to the relatively poor effectiveness measured against influenza A(H3N2) – the predominant strain. The effectiveness against GP presentation with influenza A(H1N1)pdm09 and B were estimated to be higher at 50% and 57%, respectively.

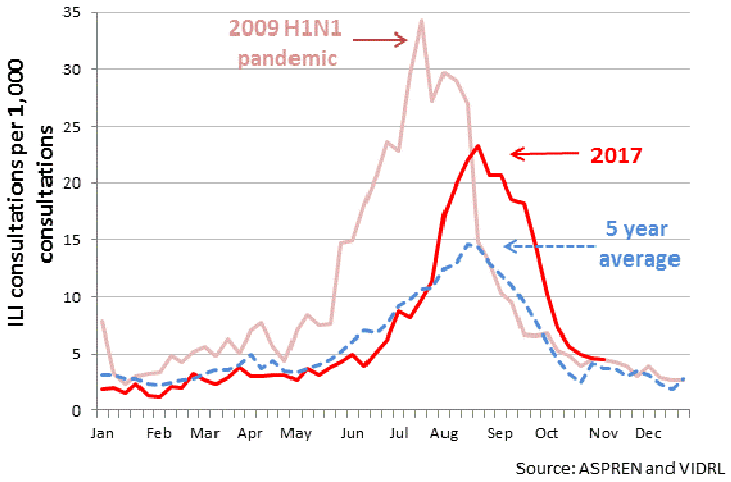
ANALYSIS

Activity levels

- Influenza-like illness (ILI) activity in the Australian community in the 2017 influenza season was higher than in recent years, in most, but not all states and territories, but did not exceed the 2009 pandemic year.
- In 2017, in the peak 8 weeks of Flutracking ILI activity, 20.8% of participants reported fever and cough compared with the 5 year average of 17.8%.[1]
- Nationally, the average sentinel GP ILI consultation rate for the seasonal period (14.8 per 1,000 consultations) was higher than the 5 year average for the period (10.3 per 1,000 consultations) but did not exceed the 2009 pandemic year (19.0 per 1,000 consultations) (Figure 1).[2,3]
- Influenza circulated at high levels throughout the 2017 season. For the seasonal period, 47% of patients presenting to sentinel GPs with ILI tested positive for influenza. This was slightly higher than the 5 year historic range for the same period (range: 27% in 2013 to 45% in 2012).[2]
- The 2017 seasonal peak was prolonged when compared with recent seasons. Since the season commenced in mid-June, influenza positivity in patients presenting to sentinel GPs with ILI exceeded 50% for 6 weeks.[2] In the previous 5 years weekly influenza positivity exceeded 50% for five weeks in 2012 and 2015, three weeks in 2016, 1 week in 2014 and at no point in 2013.

- Despite ILI activity being moderate during the interseasonal period from January to March 2017, influenza positivity was higher than the 5 year historic range.[4]

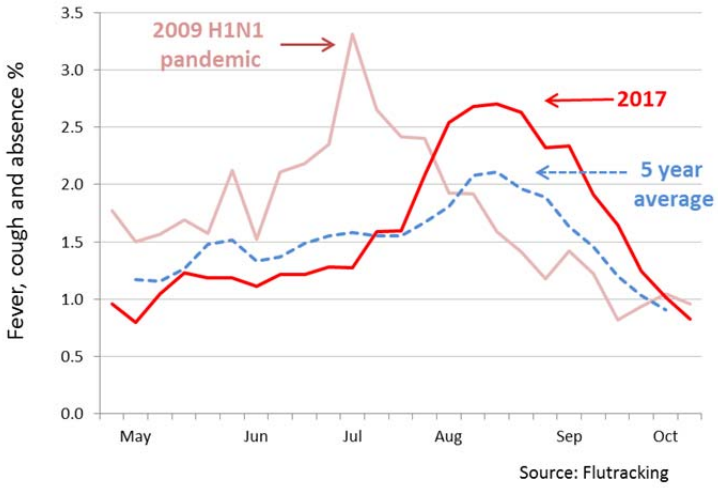
Figure 1. ILI presentations to sentinel general practitioners, by week, 2009-2017, Australia



Impact

- The higher level of activity in the community this year has led to higher levels of absenteeism. Additionally, people in the community with ILI have been slightly more inclined to seek health advice from a GP than in recent years.
- In 2017, the peak 8 weeks of Flutracking ILI activity, 16.5% of participants reported fever, cough and absence from normal duties compared with the 5 year average of 13% (Figure 2).[1]
- In 2017, in the peak 8 weeks of Flutracking ILI activity, 40.8% of participants with fever and cough sought health advice from a GP compared with the five year average of 37.5%.[1]
- There has been more than two and a half times the number of laboratory confirmed notifications of influenza reported to the National Notifiable Diseases Surveillance System (NNDSS) this year to date (total number=233,453) when compared with the same period last year (n=87,333), reflecting a longer duration and more intense season.[6] While difficult to quantify, increased uptake of polymerase chain reaction tests in primary care and rapid testing in hospitals have contributed to year on year increases in laboratory confirmed influenza notifications since the 2009 pandemic. In particular in 2017, systematic introduction of rapid influenza testing in hospitals in one large state (New South Wales) may have contributed in part to increased case detection.
- Admissions with confirmed influenza to sentinel hospitals in 2017 year to date have been 2.3 times the 5 year average.[5] This is likely to reflect the higher number of cases overall rather than a greater severity of infection. Based on the ratio of beds in sentinel hospitals to the number of hospital beds nationally, there have been an estimated 29,000 admissions with confirmed influenza in Australia since April 2017.

Figure 2. Fever, cough and absence among Flutracking participants, by week, 2009-2017, Australia



Severity in people with infection

- Despite the increased number of admissions with confirmed influenza in most states and territories, the clinical severity of patients hospitalised, based on proportion admitted to intensive care units (ICU), was on the low end of the 5 year historic range.
- Approximately 8.9% of patients with confirmed influenza at sentinel hospitals were admitted to ICU in 2017, which is within the range of the past 5 years (range: 8.7% in 2015 to 14.2% in 2013).[5]
- The proportion of hospitalised patients admitted to ICU when compared with recent seasons may be influenced by increased recognition and testing of influenza as a cause of disease among non-ICU hospitalised patients.
- ICU admissions in hospitalised patients ranged by influenza type and subtype – from 8.5% of patients with influenza B to 8.6% of patients with influenza A(H3N2) and 16.0% of patients with influenza A(H1N1)pdm09.[5]
- There is no one surveillance system that accurately and rapidly captures deaths attributable to influenza at the national level, making assessment of the mortality associated with influenza challenging. The methods by which influenza-related deaths are determined and reported vary by state and territory.
- Deaths reported in notified cases of laboratory confirmed influenza to the NNDSS were the highest in 2017 to date (n=745) than in any previous year (5 year average=176). However, as a ratio to all notified cases, deaths in 2017 (1 death per 318 notifications) on the low end of the 5 year historic range (range: 1 death per 318 notifications in 2012 to 1 death per 468 notifications in 2015).[6]
- Deaths reported in notified cases to the NNDSS have largely been in the elderly, which is consistent with a season dominated by influenza A(H3N2). The median age of deaths reported in notified cases was 86 years (range: 3 to 107 years), with more than 91% of deaths in people aged 65 years and older.[6]
- New South Wales (NSW) death registration data demonstrated an increase in the number of reported deaths in 2017 with influenza or pneumonia mentioned in the medical cause of death text. The rate per 100,000 population had a sustained peak in August and September, which was above the expected range and exceeded the peaks in the past 5 years. The majority of deaths registered were in person aged 65 years and older.[7]

At-risk populations

- Notification rates have been highest in adults aged 80 years or older mostly affected by influenza A (H3N2), with a secondary peak in young children, aged 5 to 9 years mainly attributable to influenza B.[6]
- Of the paediatric cases (aged less than 16 years) who were admitted with confirmed influenza to sentinel hospitals, 12% have been children aged less than 6 months and another 20% have been children between 6 months and 2 years.[5]
- In jurisdictions where Indigenous status was reported in more than 50% of notifications (the Australian Capital Territory, the Northern Territory and Western Australia), the age-standardised Indigenous to non-Indigenous rate ratio for notification of laboratory confirmed influenza was 2.5.[6]

Virology and preliminary vaccine effectiveness

- Influenza A(H3N2) was the predominant virus in circulation this season. However, influenza B also circulated at high levels and contributed to the prolonged peak.[6]
- For the year to date, 62% of notifications of laboratory confirmed influenza to the NNDSS were influenza A (56% influenza A(unsubtyped), 1% influenza A(H1N1)pdm09 and 4% influenza A(H3N2)), 37% were influenza B and less than 1% were influenza A&B co-infections or untyped.[6] Based on the assumption that A(unsubtyped) notifications had the same subtype distribution as the swab tests from ASPREN GPs, the distribution of influenza viruses nationally for the year to date was estimated to be 55% influenza A(H3N2), 8% influenza A(H1N1)pdm09 and 37% influenza B.
- Haemagglutination inhibition assay (HAI) testing of samples from sentinel influenza GP networks indicated that isolates were generally antigenically similar to their respective vaccine strains. Thirty-seven percent of A(H3) viruses yielded insufficient haemagglutinin titres for testing by HAI and were instead assessed by focus reduction assay (FRA). In HAI and FRA, 10% and 0% of A(H3) viruses, respectively, were low reacting to post-infection ferret antisera raised to cell-propagated A/Hong Kong/4801/2014-like viruses. However,

these proportions increased to 33% and 20%, respectively, when tested against egg-propagated reference virus.[8]

- Influenza viruses are continually changing, making the targeting of an effective vaccine a constant challenge each year.
- Preliminary vaccine estimates are based on incomplete data and may change once all data from the season are collated. Final estimates will be produced after the season has returned to baseline levels and are more reliable.
- Estimated overall vaccine effectiveness against GP presentation was 33% (95% CI: 17,46), based on incomplete data.[8] Protection was estimated to be higher against influenza A(H1N1)pdm09 (VE=50%; 95% CI: 8,74) and B (VE=57%; 95% CI: 41,69) than influenza A(H3N2) (VE=10%; 95% CI: -16,31).
- Estimated overall vaccine effectiveness against hospitalisation with confirmed influenza was 16% (95% CI: -0.5%, 30.1%), based on incomplete data.[5] Protection was estimated to be higher in adults aged less than 65 years (VE=43%; 95% CI: 20%, 60%) and children aged less than 16 years (VE=12%; 95% CI: -38%, 44%) than in the elderly aged 65 years and older (VE=-12%; 95% CI: -47%, 13%).
- Differences between VE against GP presentation and against hospitalisation may reflect differences in populations (older patients in hospitalised group) and potential attenuation of severity of illness by vaccination.
- The preliminary estimate of vaccine effectiveness against GP presentation for the 2017 season is lower than in previous years. Vaccine effectiveness against GP presentation ranged from 38% to 60% between 2012 and 2015 and was 42% in 2016.
- The preliminary estimate of vaccine effectiveness against hospitalisation for the 2017 season is lower than previous years, but similar to 2016. Vaccine effectiveness against hospitalisation ranged from 38% to 50% between 2011 and 2015, but was 18% in 2016.
- Factors potentially contributing to the lower vaccine effectiveness include the genetic diversity of the dominant A(H3N2) strains currently circulating, the higher proportion of elderly affected, who are known to have reduced responses to vaccines and ongoing problems with identifying suitable A(H3N2) vaccine candidates. There are persistent problems with A(H3) candidate vaccine viruses which, when propagated in eggs, rapidly acquire adaptive changes which alter antigenicity.

Key geographical variations

- While eastern seaboard states and South Australia all experienced unusually high levels of influenza activity in 2017, activity in Western Australia (WA) was moderate, and on most indicators was lower than in 2016 and 2015. The distribution of sub-types through the season in WA was similar to other parts of the country, with A/H3N2 predominating (70-80% of detections), and around 10% of each of A/H1N1 and influenza B viruses.[9]
- In the ACT, the 2017 season was bimodal in pattern. Notifications were initially dominated by influenza A (A/H3 accounted for 90.5% of influenza A samples that were subtyped) and peaked in week 33. As influenza A notifications began to decline, influenza B notifications increased, resulting in a second slightly smaller peak in week 37.

FURTHER INFORMATION

No one single system, including notification data, provides the full picture on influenza, because influenza is a common disease and its presenting symptoms are non-specific. The epidemiology of influenza is informed by a number of different systems based in the community, laboratories, primary care and hospitals, as well as official deaths and notifiable diseases data. Throughout the influenza season in Australia these systems are reported in the Australian Influenza Surveillance Report at www.health.gov.au/flureport. For further details about information contained in this report please contact the Influenza Surveillance Team (flu@health.gov.au).

Throughout the summary, where the seasonal period is presented, this is from week 25 (week beginning 17 June 2017) to week 41 (week beginning 7 October 2017). Where the year to date is presented, this includes data from 1 January to 21 November 2017. NNDSS data were extracted on 22 November 2017. Due to the dynamic nature of the NNDSS and other surveillance systems, data in this report are subject to retrospective revision and may vary from data reported in other national reports and reports by states and territories.

The National Influenza Surveillance Committee is a subcommittee of the Communicable Diseases Network Australia.

For further information regarding influenza activity at the jurisdictional level, please refer to the following State and Territory health surveillance reports:

- Australian Capital Territory: Influenza Surveillance in the ACT (http://www.health.act.gov.au/public-information/public-health/public-health-alerts/influenza-act)
- New South Wales: Influenza Surveillance Report (http://www.health.nsw.gov.au/Infectious/Influenza/Pages/reports.aspx)
- Queensland: Statewide Weekly Influenza Surveillance Report (https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/surveillance/reports/flu)
- South Australia: Weekly Epidemiological Summary (Influenza section) (http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+statistics/surveillance+of+notifiable+conditions)
- Tasmania: fluTAS Reports (http://www.dhhs.tas.gov.au/publichealth/communicable_diseases_prevention_unit)
- Victoria: Influenza Surveillance Reports (http://www.vidrl.org.au/surveillance/influenza-surveillance/)
- Western Australia: Virus WAtch (http://ww2.health.wa.gov.au/Articles/F_I/Infectious-disease-data/Virus-WAtch)

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1 Flutracking Flutracking.net

2 Australian Sentinel Practitioners Research Network (ASPREN) https://aspren.dmac.adelaide.edu.au/

3 Victorian Sentinel Practice Influenza Network (VicSPIN) http://www.vidrl.org.au/surveillance/influenza-surveillance/

4 ASPREN, *ASPREN Rapid Update*, Issue 1 April 2017. Available at https://aspren.dmac.adelaide.edu.au/documents/20714/117162/Rapid+ASPREN+update+April+2017/12b71d06-ae98-4e37-9d5a-564ae806cae6?version=1.0

5 Influenza Complications Alert Network (FluCAN)

6 National Notifiable Diseases Surveillance System (NNDSS) – www.health.gov.au/nndssdata

7 Death Registrations Unit Record File, NSW Ministry of Health, Secure Analytics for Population Health Research and Intelligence (SAPHaRI) - www.health.nsw.gov.au/Infectious/Influenza/Pages/reports.aspx

8 Sullivan S et al, *Low mid-season influenza vaccine effectiveness in Australia, 2017*. Eurosurveillance rapid communication http://eurosurveillance.org/content/10.2807/1560-7917.ES.2017.22.43.17-00707

9 Virus Watch http://ww2.health.wa.gov.au/Articles/F_I/Infectious-disease-data/Virus-WAtch