



2018 Influenza Season in Australia
A summary from the National Influenza Surveillance Committee

KEY MESSAGES

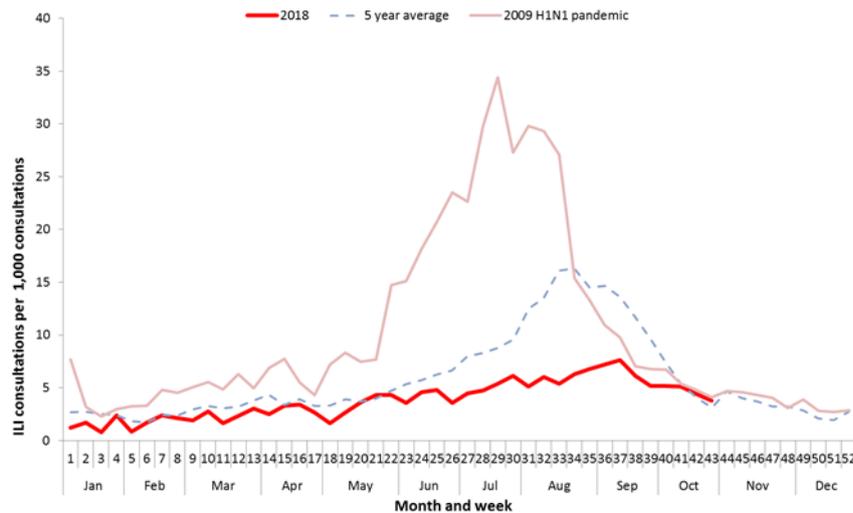
- **Activity** – While there was some geographic variation across Australia, in general the 2018 influenza season saw very low levels of activity compared to recent years. There was a gradual start to the season, with a short, delayed peak.
- **Impact** –The impact of circulating influenza on society, as measured through the proportion of people with influenza-like illness (ILI) taking time off work, and the burden placed on hospitals with people admitted with influenza, was low.
- **Severity** –Clinical severity for the 2018 season, as measured through the proportion of patients admitted directly to intensive care unit (ICU), and deaths attributed to influenza, was moderate.
- **Virology** –Influenza A(H1N1)pdm09 predominated nationally, accounting for an estimated 53% of notified laboratory confirmed cases of influenza for the year to date.
- **At-risk populations:** Children aged less than 10 years appear were more commonly infected with influenza; however the severity of illness in this population was on par with other age-groups.
- **Vaccine effectiveness:** Based on preliminary data, vaccinated individuals were 68% less likely to present to a general practitioner (GP) and 58% less likely to be hospitalised due to influenza, when compared to unvaccinated individuals.

ANALYSIS

Activity

- ILI in the Australian community in the 2018 influenza season was lower or within the bounds of recent years.
- While there was a small peak in mid-August, there was no distinct seasonal trend for Flutracking ILI activity in 2018. In the peak five weeks of seasonal activity, 9% of participants reported fever and cough, compared with the 5 year average of 14%.¹
- Nationally, the average sentinel GP ILI consultation rate for the seasonal period (5.9 per 1000 consultations) was lower than the five year average for the same period (11.8 per 1000 consultations).^{2,3}
- Year to date, there were 48,276 notifications of laboratory confirmed influenza to the National Notifiable Diseases Surveillance System (NNDSS) in 2018, which is less than half of the 5 year average (107,450).⁴
- Admission with confirmed influenza to sentinel hospitals in 2018 (n=786) was just over one third of the 5 year average (2,258).⁵
- Influenza circulated at low levels throughout the 2018 season. For the seasonal period, 14% of patients presenting to sentinel GPs with ILI tested positive for influenza.
- The 2018 seasonal peak was short and delayed compared to recent years. Influenza positivity in patients presenting to sentinel GPs with ILI did not exceed 50% in any week during the seasonal period. In the previous 5 years, weekly influenza positivity exceeded 50% for six weeks in 2017, five weeks in 2015, three weeks in 2016, 1 week in 2014 and at no point in 2013.

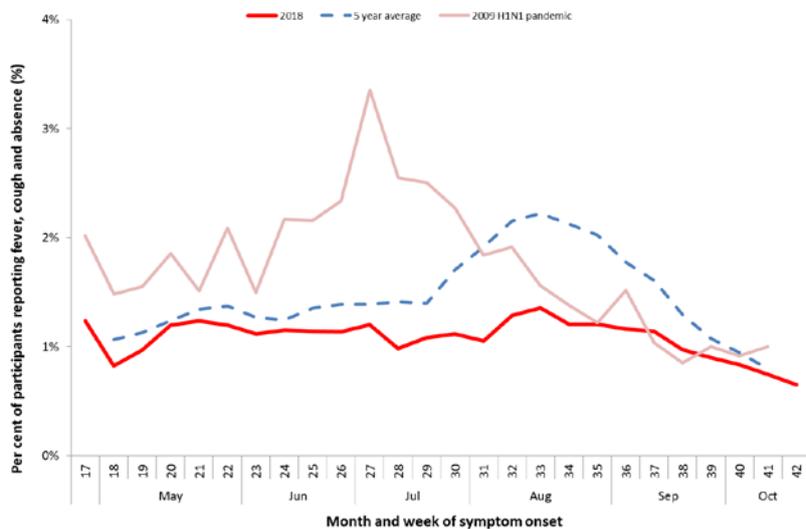
Figure 1. ILI presentations to sentinel general practitioners, by week, 2009, 2013-2018, Australia



Impact

- The lower level of activity in the community this year has led to circulating influenza having a lower level of impact on society and the healthcare system.
- In the 2018 seasonal period, 12.5% of Flutracking survey respondents reported having ILI and taking time off regular duties while unwell, compared with the five year average of 18.2% (Figure2).
- In 2018, 11% of hospital beds available in FluCAN hospitals were occupied by patients with confirmed influenza. This is a low level of impact when compared to temporal trends (5 year average = 32%).
- Based on the ratio of beds in sentinel hospitals to the number of hospital beds nationally, there were an estimated 5,800 admissions with confirmed influenza in Australia between 3 April and 31 October, 2018.

Figure 2. Fever, cough and absence among Flutracking participants, by week, 2009, 2013-2018, Australia



Severity

- Despite considerably fewer admissions with confirmed influenza, the clinical severity of patients hospitalised, based on the proportion admitted to ICU, was on par with recent years.
- Approximately 8% of patients with confirmed influenza at sentinel hospitals were admitted to ICU in 2018, which is within the range of the past 5 years (range: 7% in 2015 to 11% in 2014).
- The proportion of hospitalised patients admitted to ICU ranged by influenza type and subtype – from 3.1% of patients with influenza A(H3N2) to 7.6% of patients with influenza B and 8.1% of patients with influenza A(H1N1)pdm09.
- The number of deaths reported in notified cases of laboratory confirmed influenza to the NNDSS in 2018 to date (n=57) was considerably lower than the 5 year average (378). Furthermore, as a ratio to all notified

cases, deaths in 2018 (1 death per 847 notifications) was also much lower than the 5 year historic range (range: 1 death per 457 notifications in 2015 to 1 death per 218 notifications in 2017).

- Deaths reported in notified cases to the NNDSS have largely been in the elderly. The median age of deaths reported in notified cases was 80 years (range: 1 to 100 years), with 75% of deaths in people aged 65 years and older.⁴
- The number of influenza-associated deaths reported to the NNDSS does not represent the true mortality associated with this disease. The number of deaths is reliant on the follow up of cases to determine the outcome of their infection. The follow up of cases is not a requirement of notification, and are only inclusive of laboratory-confirmed cases of influenza. Due to retrospective revision, the variation across jurisdictions in methodology, representativeness and timeliness of death data, and reporting of an outcome of infection not being a requirement of notification, year on year comparisons of deaths in notified cases of influenza may not be reliable.

Virology

- Influenza A(H1N1)pdm09 was the predominant virus in circulation this season.
- For the year to date, 77% of notifications of laboratory confirmed influenza to the NNDSS were influenza A (67% influenza A(untypeded), 7% influenza A(H1N1)pdm09 and 3% influenza A(H3N2)), 22% were influenza B and less than 1% were influenza A&B co-infections or untyped. Based on the assumption that A(untypeded) 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 53% influenza A(H1N1)pdm09, 24% influenza A(H3N2) and 22% influenza B.
- From 1 January to 12 November 2018, 886 isolates were characterised for similarity to the corresponding vaccine components by haemagglutination inhibition (HI) assay. Influenza A(H1N1)pdm09 viruses and viruses from both influenza B lineages appeared to be antigenically similar to the corresponding vaccine components. Less than 1% of Influenza A(H1N1)pdm09, 1.2% of influenza B(Yamagata), and no influenza B(Victoria) isolates were characterised as low reactors.⁶
- The influenza A(H3N2) isolates that were able to be assessed by HI assay appeared to be reasonably matched, with only 1.8% of isolates characterised as low reactors. However, there are ongoing technical issues that significantly limit the WHOCC's capacity to fully assess the similarity of circulating influenza A(H3N2) viruses to the vaccine strain. For the year to date, there were an additional 33 influenza A(H3N2) isolates that were unable to be characterised in the HI assay due to insufficient haemagglutination titre.

Preliminary vaccine effectiveness

- Influenza viruses are continually changing, making the targeting of an effective vaccine a constant challenge each year.
- Preliminary vaccine effectiveness (VE) 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.
- Interim vaccine effectiveness estimates were determined using GP presentation and hospitalisation data.
- Compared to unvaccinated individuals, vaccinated individuals were 68% (95% CI: 45, 82) less likely to present to a GP due to all influenza. Protection was estimated to be higher against influenza A(H1N1)pdm09 (VE=78%, 95% CI: 51, 91).²
- Compared to unvaccinated individuals, vaccinated individuals were 58% (95% CI: 46, 67) less likely to be hospitalised due to all influenza. Protection was estimated to be slightly higher against influenza A(H1N1)pdm09 (VE=60%, 95% CI: 47,69) and lower for influenza B (VE=50%, 95% CI: 15, 71). Estimates for influenza A(H3N2) were not able to be calculated due to an inadequate sample size.
- Differences between vaccine effectiveness against GP presentation and against hospitalisation may reflect differences in populations (older patients in the hospitalised group) and potential attenuation of severity of illness by vaccination.
- The preliminary estimate of vaccine effectiveness against GP presentation for the 2018 season is higher than in previous years. Vaccine effectiveness against GP presentation ranged from 35% to 60% between 2012 and 2017.
- The preliminary estimate of vaccine effectiveness against hospitalisation for the 2018 season is also higher than the 5 year historical range (range: 13% in 2016 to 50% in 2015).

- The estimated effectiveness of the vaccine may depend on a number of factors – the outcome being measured, the age group predominantly affected (vaccine effectiveness is generally lower in older people than in younger adults and children), and the match between vaccine and circulating influenza strains (generally protection against infection with A/H1N1pdm09 is greater than against A/H3N2).

Geographical variations

- Similar to national trends, all states apart from WA experienced considerably less influenza activity levels during the seasonal period than in 2017 and notifications were much lower than the five year mean. In WA, the contrast between 2018 and 2017 seasons and the 5 year mean was less pronounced due to WA having a much milder 2017 season than the southern and eastern states.
- There was also variation across jurisdictions in the influenza type and subtype distribution. The proportion of all notifications year to date reported as influenza A ranged from 67% in the NT to 81% in NSW. Where subtyping information was available, all jurisdictions reported a greater proportion of influenza A(H1N1)pdm09 than influenza A(H3N2).
- The NT experienced an increase in cases in the Top End in late October which developed into a full scale season with high transmission over the next few weeks. By early December the activity had spread across the Top End without evidence of it reaching Central Australia. The activity was caused by influenza A(H1N1)pdm09 and was of moderate seriousness. As at 7 December 2018, virus testing at the World Health Organization Collaborating Centre for Reference and Research on Influenza (WHOCC) has revealed no significant variation from the A(H1N1)pdm09 vaccine strain A/Michigan/45/2015.

At-risk Populations

- Notification rates were highest in children aged under 10 years mostly affected by influenza A(H1N1)pdm09, with a secondary smaller peak in adults aged 80 years or older, mainly attributable to influenza A(H3N2).⁴
- Medical comorbidities were common in hospitalized patients aged over 65 years (84.8%) but less common in children aged under 18 years (39.4%).
- Of hospitalized patients with confirmed influenza, 6.0% were Indigenous Australians. Of the 110 hospitalisations with influenza in females 16-50 years, 14.6% were pregnant.⁵
- Where subtyping information was available, influenza A(H1N1)pdm09 was the predominant strain in all age groups except in adults aged 65 years and older, where influenza A(H3N2) accounted for a greater proportion of influenza A.⁴
- ICU admissions with confirmed influenza were similar by age group. Of the children admitted with confirmed influenza, 6.7% were admitted to ICU. This is slightly less than the percentage of adults aged between 16 and 64 years (9.4%) and adults aged 65 years and older (9.0%) that were admitted to ICU.

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](http://www.health.gov.au/flureport) at www.health.gov.au/flureport. For further details about information contained in this report please contact the [Influenza Surveillance Team](mailto:flu@health.gov.au) (flu@health.gov.au).

Throughout the summary, where the seasonal period is presented, this is from week 31 (week beginning 30 July 2018) to week 42 (week beginning 15 October 2018). Where the year to date is presented, this includes data from 1 January to 11 November 2018. NNDSS data were extracted on 16 November 2018. 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: [Flu in the ACT](https://www.health.act.gov.au/about-our-health-system/population-health/winter-wellbeing-and-flu/flu-act) (https://www.health.act.gov.au/about-our-health-system/population-health/winter-wellbeing-and-flu/flu-act)
- New South Wales: [Influenza Surveillance Report](http://www.health.nsw.gov.au/Infectious/Influenza/Pages/reports.aspx) (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) (https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/surveillance/reports/flu)
- South Australia: [Weekly Epidemiological Summary](http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+statistics/surveillance+of+notifiable+conditions) (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) (http://www.dhhs.tas.gov.au/publichealth/communicable_diseases_prevention_unit)
- Victoria: [Seasonal influenza reports](https://www2.health.vic.gov.au/about/publications/researchandreports/seasonal-influenza-reports-2018) (https://www2.health.vic.gov.au/about/publications/researchandreports/seasonal-influenza-reports-2018)
- Western Australia: [Virus WATch](http://ww2.health.wa.gov.au/Articles/F_I/Infectious-disease-data/Virus-WATch) (http://ww2.health.wa.gov.au/Articles/F_I/Infectious-disease-data/Virus-WATch)

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- 1 [Flutracking](http://Flutracking.net) Flutracking.net
 - 2 [Australian Sentinel Practitioners Research Network](https://aspren.dmac.adelaide.edu.au/) (ASPREN) https://aspren.dmac.adelaide.edu.au/
 - 3 [Victorian Sentinel Practice Influenza Network](http://www.vidrl.org.au/surveillance/influenza-surveillance/) (VicSPIN) http://www.vidrl.org.au/surveillance/influenza-surveillance/
 - 4 [National Notifiable Diseases Surveillance System](http://www.health.gov.au/nndssdata) (NNDSS) – www.health.gov.au/nndssdata
 - 5 Influenza Complications Alert Network (FluCAN)
 - 6 [World Health Organization Collaborating Centre for Reference and Research on Influenza](http://www.influenzacentre.org/surveillance_samplesreceived.htm) (WHOCC) – http://www.influenzacentre.org/surveillance_samplesreceived.htm