



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

KEY MESSAGES

- **Activity** – Currently, influenza and influenza-like illness (ILI) activity is lower than average for this time of year compared to previous years, and is consistent with past activity following a peak in notifications. At the national level, notifications of laboratory-confirmed influenza have decreased in the past fortnight; however, this may be due in some measure to data entry backlogs.
- **Impact** – Impact for the season to date, as measured through the number of sentinel hospital beds occupied by patients with influenza and the rate of Flutracking respondents absent from normal duties, is low to moderate.
- **Severity** – Clinical severity for the season to date, as measured through the proportion of patients admitted directly to ICU, and deaths attributed to influenza, is low.
- **Virology** – The majority of confirmed influenza cases reported nationally were influenza A in the year to date (77%) and past fortnight (61%). The proportion of cases attributed to influenza B has increased in the past fortnight (39%), following a steady increase August.
- **Vaccine match and effectiveness** – Antigenic analysis of circulating influenza viruses in Australia in 2019 shows that the influenza A(H1N1)pdm09 and influenza B/Yamagata-lineage viruses are well matched to the 2019 influenza vaccine while some A(H3N2) and B/Victoria-lineage viruses are less well matched. Overall vaccine effectiveness appears good and as expected based on preliminary estimates from general practice (ASPREN) and sentinel hospitals (FluCAN-PAEDS), noting that effectiveness typically ranges from around 40-60% each year.

Introduction

Each year, the influenza virus changes and different strains can circulate in the population. Particular subtypes of influenza can affect different groups of the population more than others. Depending on the susceptibility of the population, the subtypes that are circulating and the changes to the virus itself, the influenza season can be very different year to year. Our surveillance systems help us to understand influenza activity, severity of the infection in individuals and impact of the illness on society in Australia. We are also able to monitor which influenza viruses are circulating, which populations might be more affected, the effectiveness of the vaccine, and any resistance to antiviral drugs that has developed.

1. Activity

Activity measures the capacity of the circulating influenza viruses to spread person to person and may be measured indirectly through systems that monitor influenza-like illness and more directly through systems that monitor laboratory confirmed influenza.

Influenza-like illness

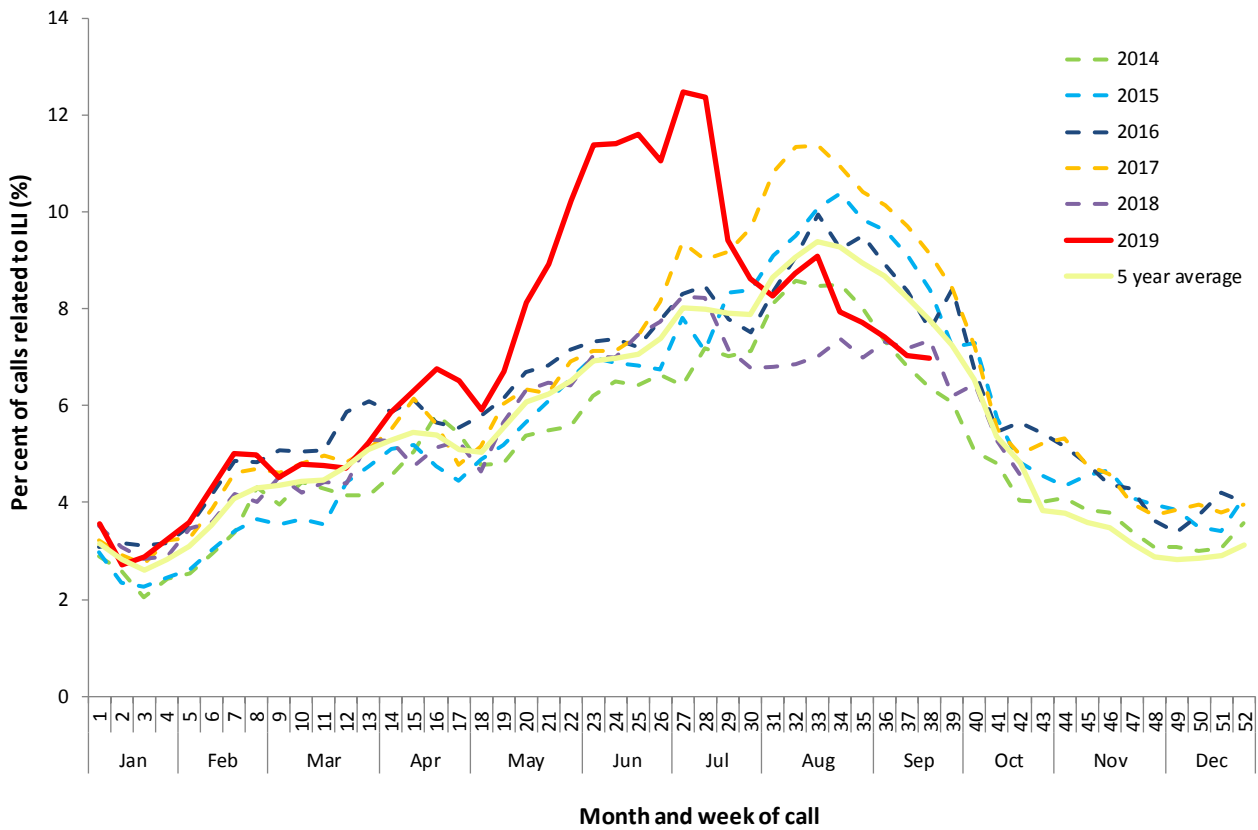
Following high levels of ILI activity over the interseasonal period, ILI in the community has decreased in the last fortnight and is below the 5 year average.

- **Healthdirect:** In the year to date, the proportion of calls to the Healthdirect public health hotline related to ILI have been declining since a peak of 12.5% in week 27 to 7.0% in week 31 and week 32 (Figure 1). Current activity is within the range of previous years.
- **Sentinel General Practitioners (ASPREN):** 6.3 per 1,000 consultations in sentinel general practices were due to ILI in week 37 (Figure 2), decreasing from a high of 13.4 per 1,000 consultations in week 28. ILI consultations are now lower than the 5 year average for this time of year and activity is now consistent with that in previous years following a peak.
- **Flutracking:** Since reporting began in week 15 Flutracking participants reporting ILI (fever and cough) has decreased from a peak of 2.14% in weeks 27 to 1.55% and 1.45% in weeks 37 and 38 respectively. Activity in the past fortnight is at similar levels to the 2018 season at the same time period (Figure 3).

- **Proportion of ILI with confirmed influenza seen by sentinel GPs:** Of the 64 ILI cases presenting to sentinel ASPREN GPs this fortnight who were tested for influenza, 15 (23%) had a positive result. This is a decrease from the previous fortnight where 35% (52/173) of swabbed ILI patients tested positive for influenza. In the reporting fortnight, 16% (n=10) of swabbed patients were infected with influenza A, which was the second most common respiratory virus detected; rhinovirus had the highest number of positive results (n=14, 22%).
- **Proportion of ILI with confirmed influenza in sentinel labs:** In the reporting fortnight, the pooled unweighted percentage of tests positive for influenza across all sentinel laboratories was 12.1%, a decrease from 15.7% reported in the previous fortnight. In the past fortnight, percent positivity was highest in Tasmania at 15.4% (Figure 4). In the year to date, overall detections of influenza across sentinel laboratories peaked in weeks 16 (26.9%) and 17 (26.8%).
The most commonly detected respiratory viruses this fortnight by laboratory site were:
 - influenza A in both weeks by the Institute of Clinical Pathology and Medical Research in New South Wales (NSW);
 - rhinovirus in both weeks by South Australia (SA) and Tasmania (TAS);
 - influenza A in week 37 and Picornavirus in week 38 by Victorian Infectious Diseases Reference Laboratory (VIDRL); and
 - human metapneumovirus in both weeks 37 and 38 by PathWest in Western Australia (WA).
- **NNDSS notifications¹:** In the year to date, there have been 289,731 notifications of laboratory-confirmed influenza to the National Notifiable Diseases Surveillance System (NNDSS). This fortnight there were 15,060 notifications of laboratory-confirmed influenza to the NNDSS. This is a decrease in reported cases compared to the previous fortnight (n=22,810). Notifications this fortnight were slightly higher compared to the five year average (n=14,932) (Figure 5). In the year to date, there has been an overall decline in notifications per week following a peak in week 27 (n=18,331).
- **FluCAN:** Since seasonal sentinel hospital surveillance began on 1 April 2019, a total of 3,732 people have been admitted with confirmed influenza (Figure 6). In the fortnight to 22 September 2019, 57 people have been admitted with confirmed influenza. This is a decrease from the 165 reported in the previous fortnight, however, it is likely that this is a result of an administrative backlog and that numbers will be revised upwards. There has been an overall decline in the number of hospitalisations per week following a peak in week 26 (n=237). In the reporting fortnight, the total number of admissions is less than the 5-year average for the same period (n=304), with the pattern of activity now reflecting a typical season, albeit far earlier than usual.

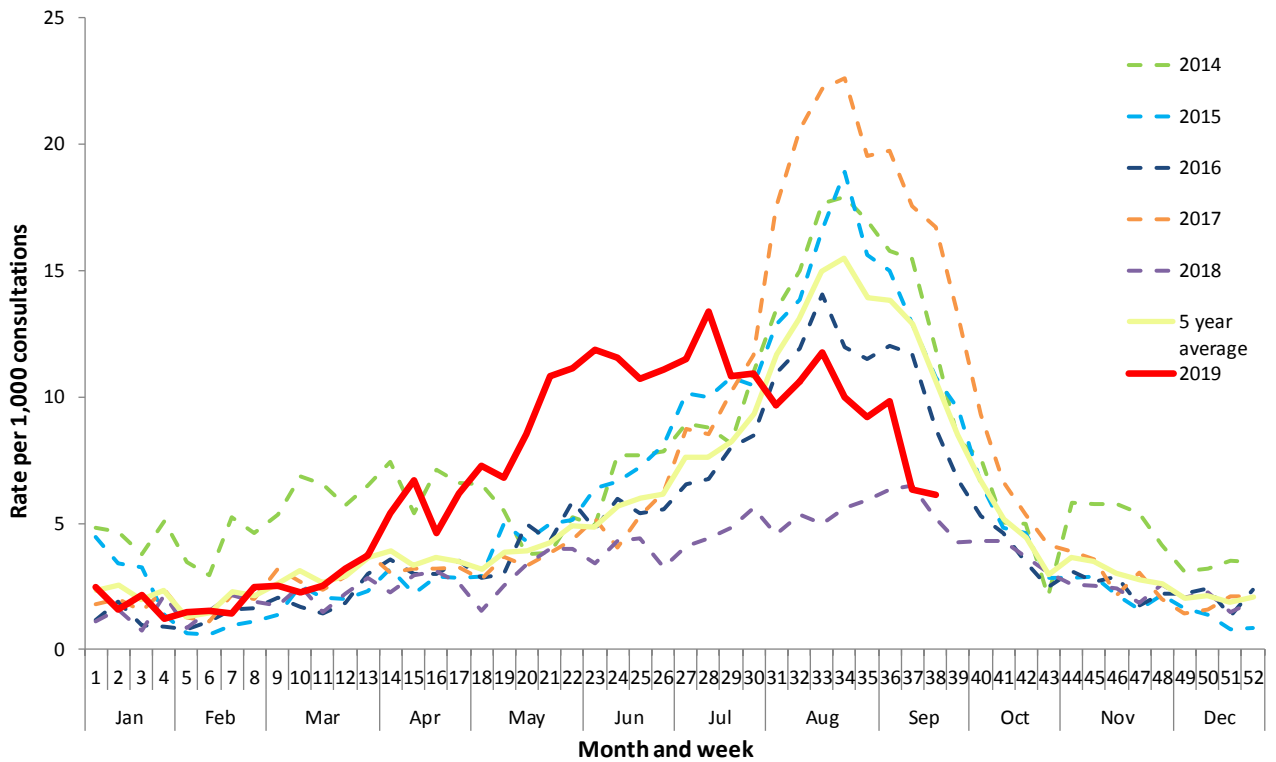
¹NNDSS notification data provided for the current and most recent weeks may be incomplete. All data are preliminary and subject to change as updates are received.

Figure 1. Per cent of calls to Healthdirect related to ILI, Australia, 1 January 2014 to 22 September 2019, by month and week of call.



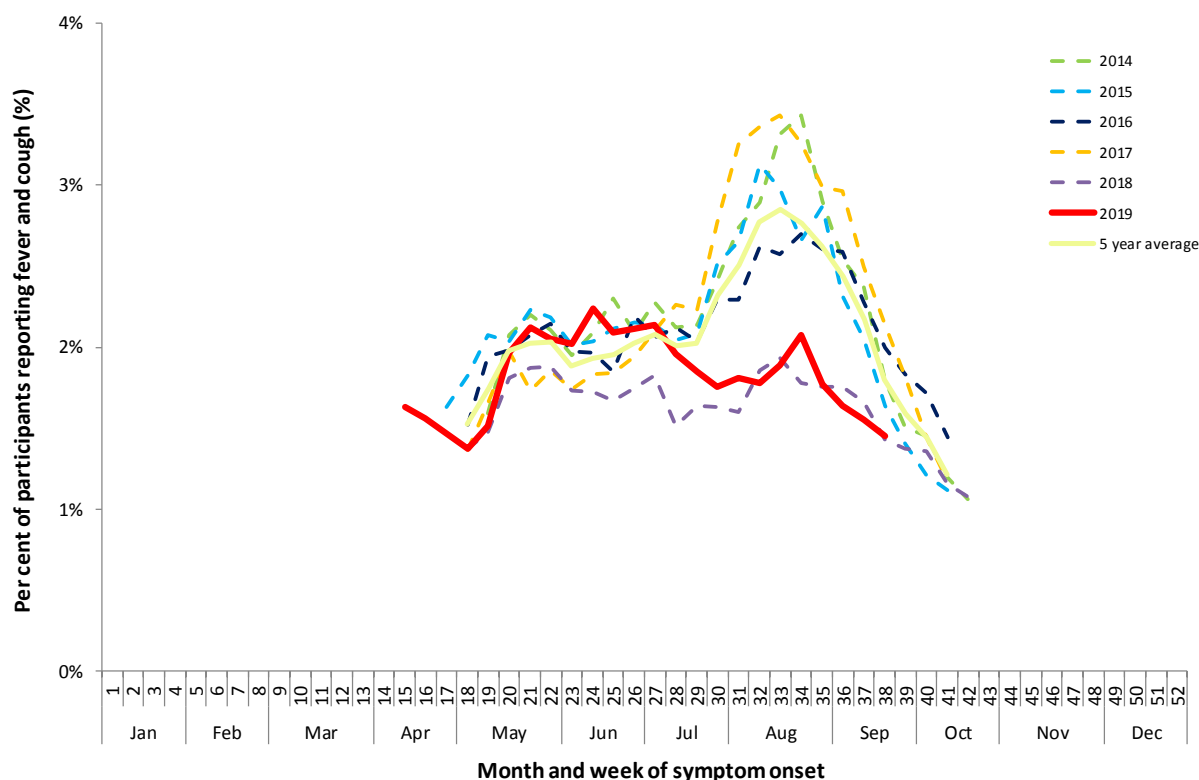
Source: Healthdirect

Figure 2. Unweighted rate of ILI reported from sentinel GP surveillance systems, Australia, 1 January 2014 to 22 September 2019, by month and week.



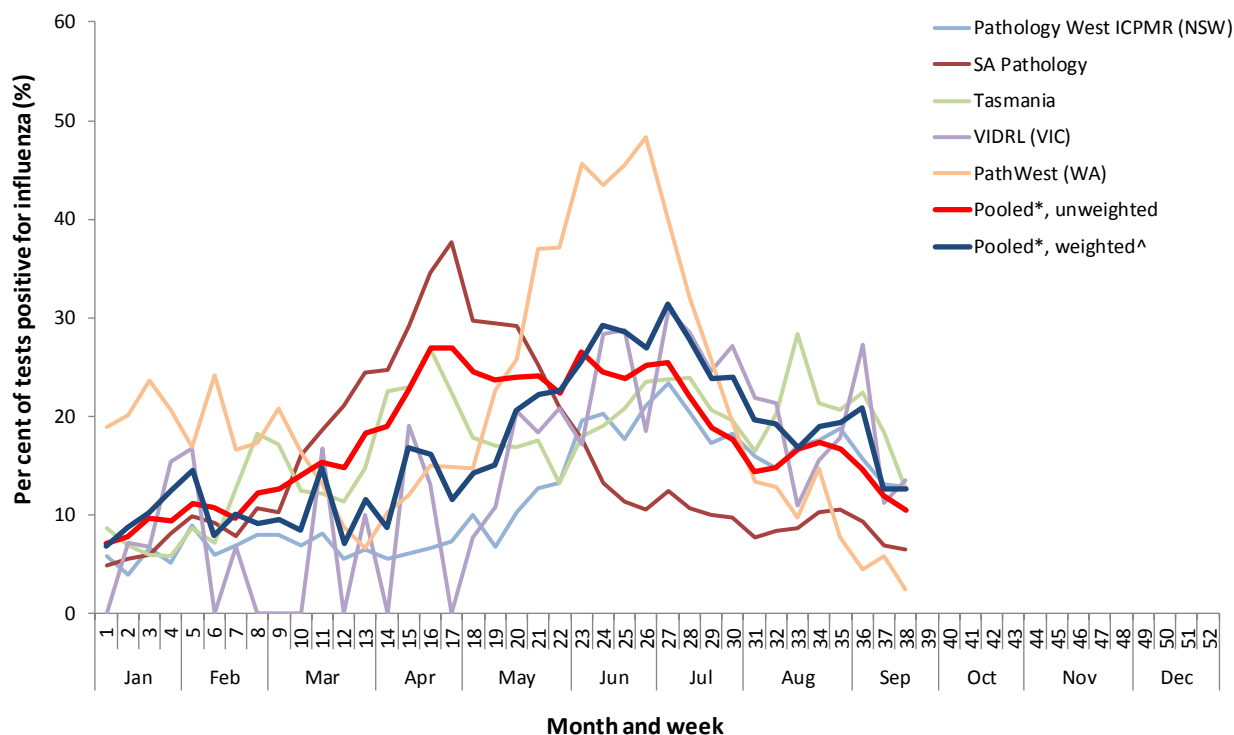
Source: ASPREN

Figure 3. Proportion of fever and cough among FluTracking participants, Australia, between April and October, 2014 to 2019, by month and week.



Source: FluTracking

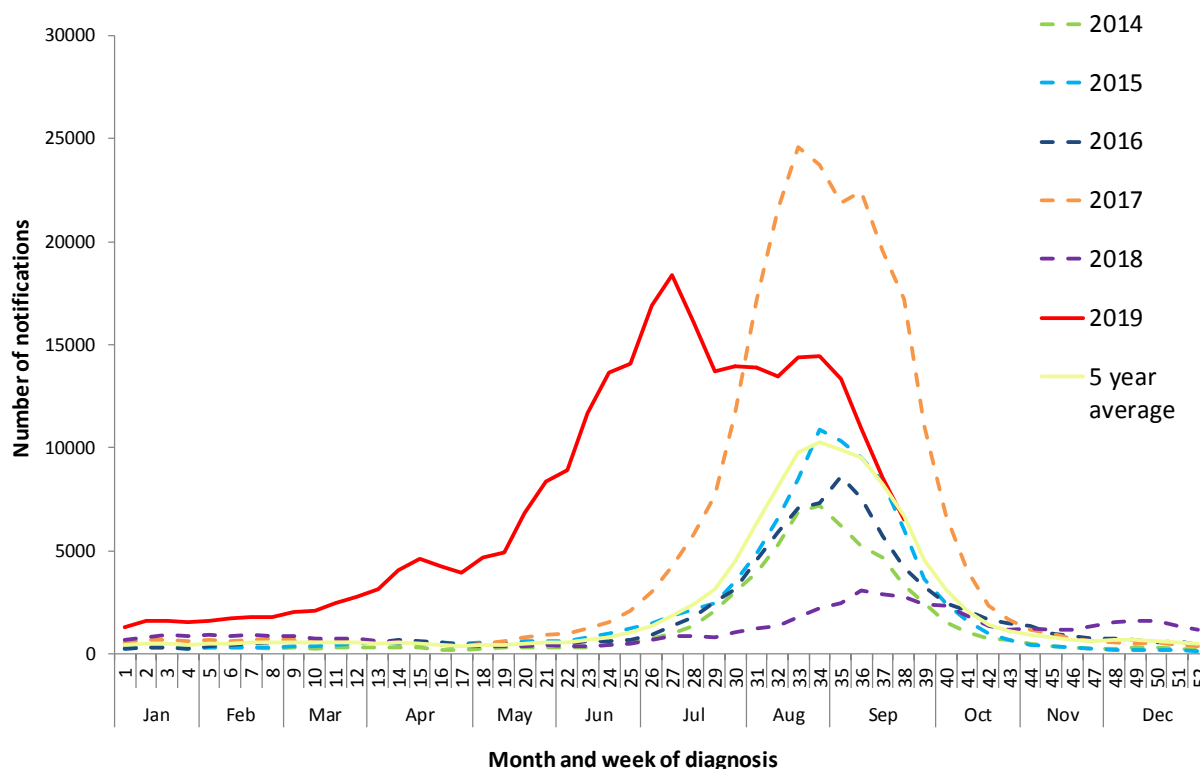
Figure 4. Proportion of sentinel laboratory tests positive for influenza, 1 January to 22 September 2019, by contributing laboratory or jurisdiction and month and week.



* Pooled percentage positive indicators should be interpreted with caution, noting that collectively pooled contributing laboratories are not representative of testing across Australia and individually contributing laboratories may not be representative of the jurisdiction in which they are located.

^ Weighted according to jurisdictional population in which laboratories are located. The percentage of tests positive for influenza in the interseasonal period should be interpreted with caution due to small numbers of tests being undertaken in this time, resulting in high variability in the indicators.

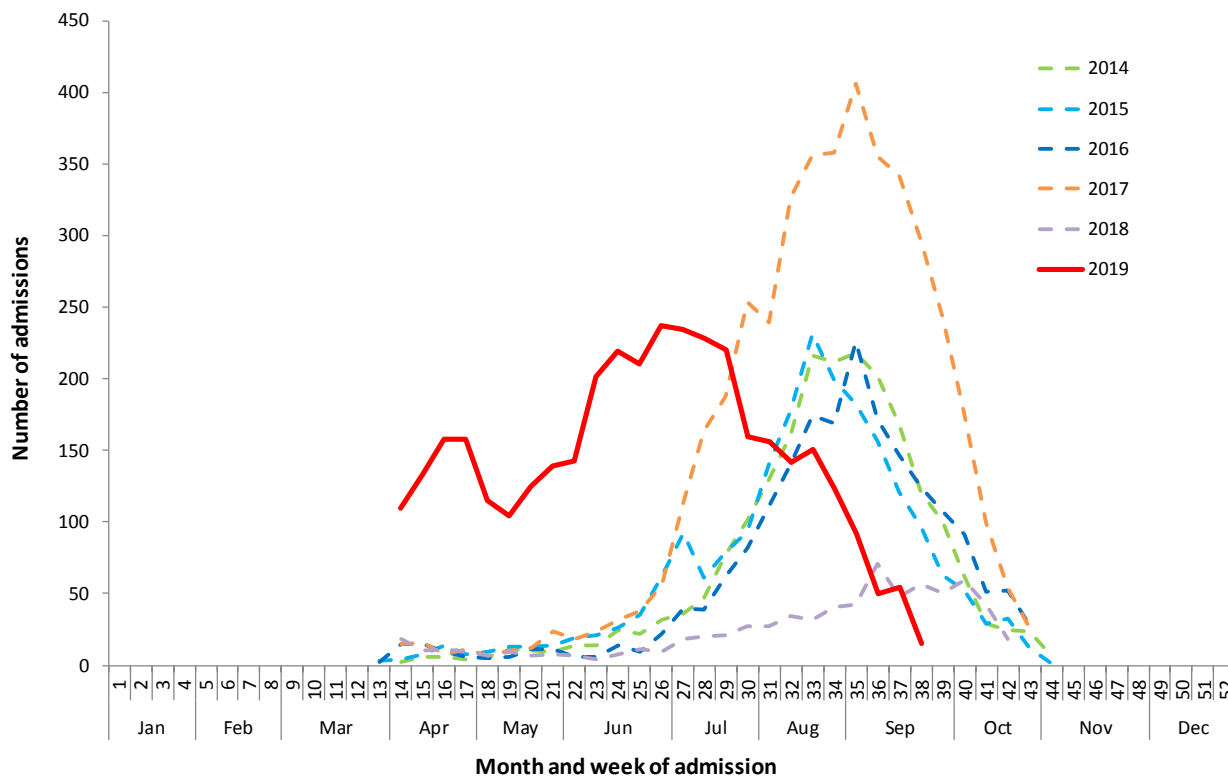
Figure 5. Notifications of laboratory confirmed influenza, Australia, 1 January 2013 to 22 September 2019, by month and week of diagnosis.*



Source: NNDSS

*NNDSS notification data provided for the current and most recent weeks may be incomplete. All data are preliminary and subject to change as updates are received.

Figure 6. Number of influenza hospitalisations at sentinel hospitals, between March and October, 2014 to 2019 by month and week.*



Source: FluCAN

*FluCAN data provided for the current fortnight may be incomplete. All data are preliminary and subject to change as updates are received.

Geographical distribution of activity

- **Jurisdictional reports:** In the fortnight ending 22 September 2019, the geographic spread of influenza activity was reported by state and territory health departments as being:
 - Widespread – NSW, South Australia (SA), the Australian Capital Territory (ACT), the Southern and Central regions of Queensland (QLD) and Victoria (VIC).
 - Regional – the Perth Metro and Southern WA region in Western Australia (WA), Tropical QLD and Tasmania (TAS).
 - Localised – Southern and Central Northern Territory (NT).
 - Sporadic – Northern WA.

The change in activity level was reported by state and territory health departments as being:

- Increased – Southern NT.
 - No change – Northern WA and Central NT.
 - Decreased – NSW, Perth Metro, South Rural WA, SA, Tropical QLD, Central QLD, Southern QLD, ACT, Victoria and Tasmania.
- **NNDSS:** Of the 15,060 notifications of laboratory confirmed influenza reported to the NNDSS in the last fortnight, 5,073 were from QLD, 4,940 from NSW, 3,865 from VIC, 694 from SA, 216 from ACT, , 149 from TAS, 63 from NT and 60 from WA* (Figure 8).
Of the 289,731 notifications of influenza reported to the NNDSS this year to 22 September 2019, 109,400 were from NSW, 63,250 from QLD, 62,103 from VIC, 24,675 from SA, 22,372* from WA, 3,814 from the ACT, 2,767 from TAS and 1,350 from the NT.

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

- ACT: [ACT Influenza Report](http://www.health.act.gov.au/about-our-health-system/population-health/winter-wellbeing-and-flu/flu-act)
(www.health.act.gov.au/about-our-health-system/population-health/winter-wellbeing-and-flu/flu-act)
- NSW: [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>)
- QLD: [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>)
- SA: [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>)
- TAS: [fluTAS Reports](http://www.dhhs.tas.gov.au/publichealth/communicable_diseases_prevention_unit) (http://www.dhhs.tas.gov.au/publichealth/communicable_diseases_prevention_unit)
- VIC: [Influenza Surveillance Reports](https://www2.health.vic.gov.au/public-health/infectious-diseases/infectious-diseases-surveillance/seasonal-influenza-reports) (<https://www2.health.vic.gov.au/public-health/infectious-diseases/infectious-diseases-surveillance/seasonal-influenza-reports>)
- WA: [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)

*Due to data transmission issues, the number of notifications reported were lower than expected for this reporting period.

Figure 7. Map of influenza activity by state and territory, Australia, 29 July to 22 September 2019

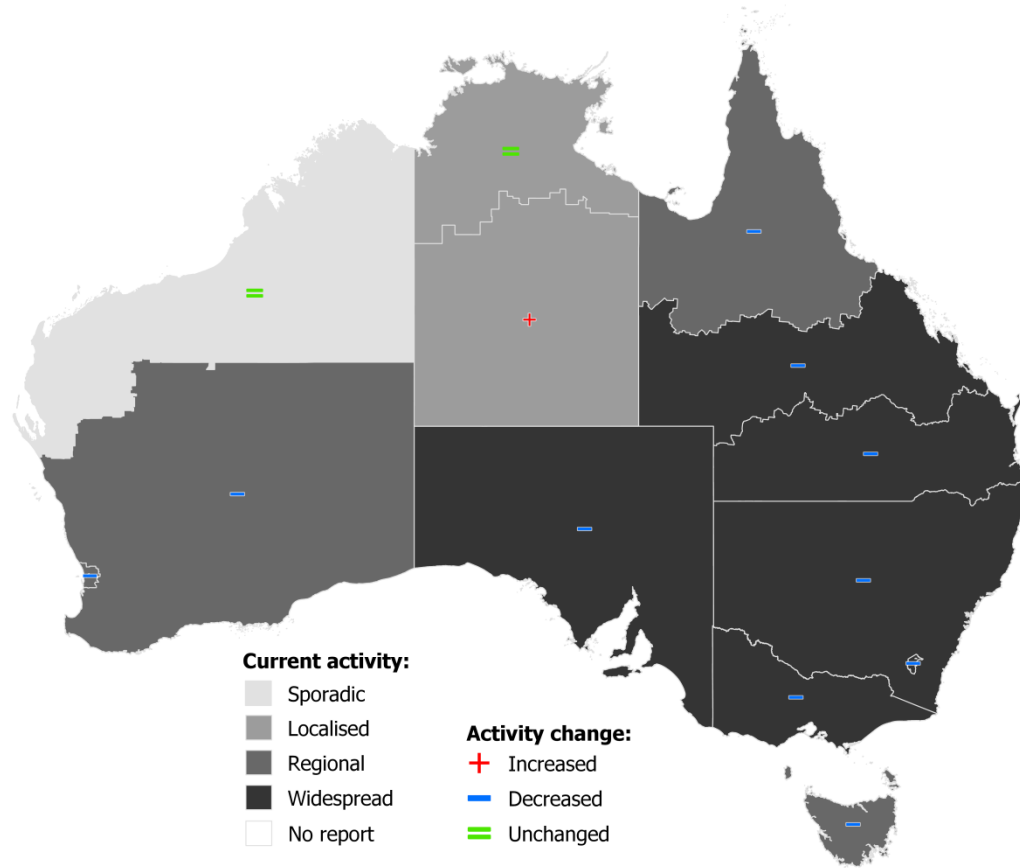
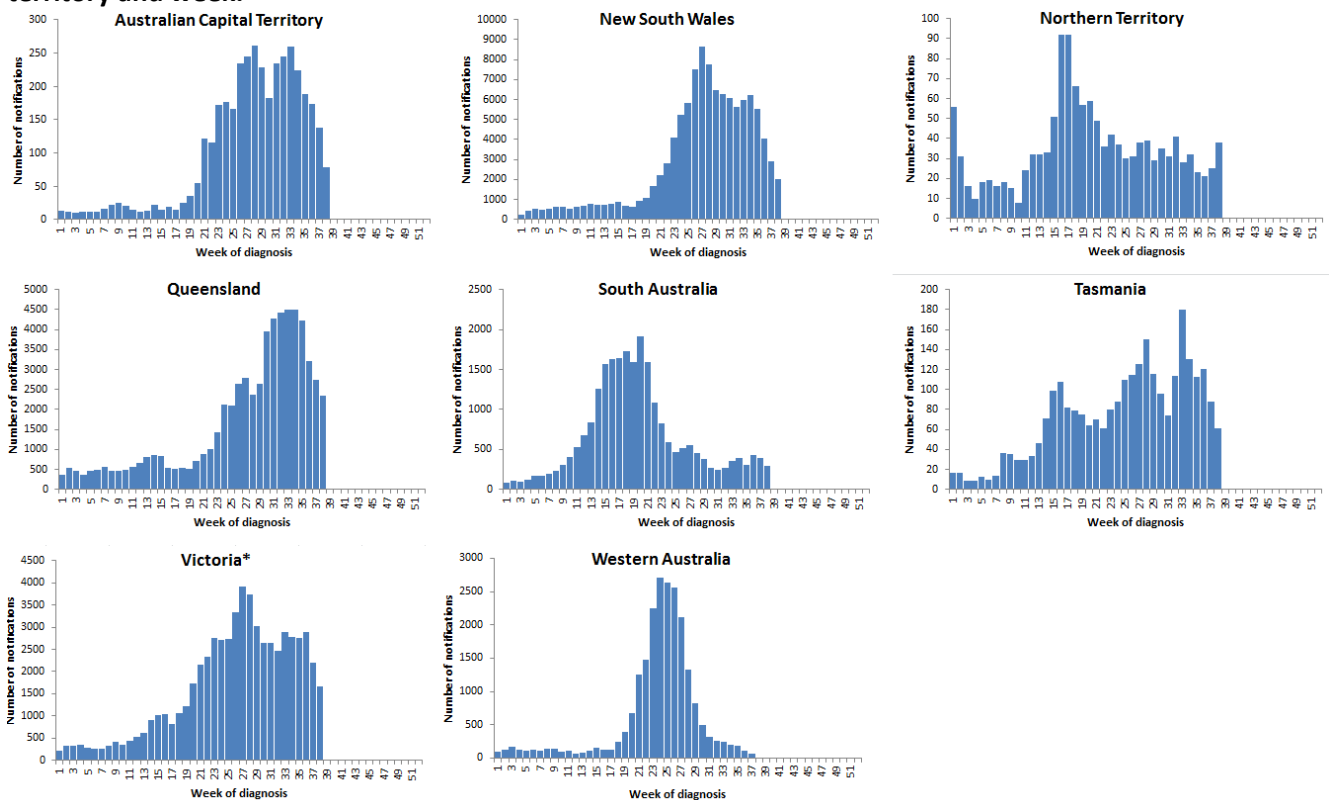


Figure 8. Notifications of laboratory confirmed influenza*, 1 January to 22 September 2019, by state or territory and week.



Source: NNDSS

*NNDSS notification data provided for the current and most recent weeks may be incomplete. All data are preliminary and subject to change as updates are received. Victoria is currently experiencing a significant backlog in data entry.

2. Severity

Severity is a measure of adverse outcomes or complications as a result of influenza or influenza-like illness (ILI) such as hospital referrals, admissions, need for intensive care and deaths. Measuring and understanding the severity of circulating influenza is difficult to establish at the beginning of the influenza season. The proportion of confirmed influenza cases with serious outcomes might be skewed initially because there are only a small number of people notified with influenza at the beginning of the season. This means that the measure of severity will vary substantially fortnight to fortnight until after the peak of the season when there is enough data for measurements to stabilise. An assessment of severity can be provided once the signals become clearer.

Clinical severity for the season to date, as measured through the proportion of patients admitted directly to ICU, and deaths attributed to influenza, is low.

Intensive care admissions

- **FluCAN:** Since seasonal sentinel hospital surveillance began on 1 April 2019, 3,732 people with influenza have been admitted to sentinel hospitals. Of those admitted, 237 (6.4%) were admitted to ICU. In the fortnight to 22 September 2019, two of the 57 people admitted to sentinel hospitals with confirmed influenza (3.5%) were admitted to ICU. This is a decrease in the proportion of people admitted to ICU compared to the previous fortnight (7.5%).

Deaths in confirmed influenza cases

- **NNDSS:** In the year to date, 705 influenza-associated deaths have been notified to the NNDSS. The majority of deaths were due to influenza A (96%, n=724). Where subtyping information was available, 118 deaths were associated with influenza A(H3N2) and 29 with influenza A(H1N1)pdm09. Influenza B were associated with 27 deaths. The median age of deaths notified was 86 years (range <1 to 105 years).

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.

3. Impact

Impact measures how the influenza epidemic affects society, including stress on health-care resources and societal and economic consequences.

Impact for the season to date, as measured through the number of sentinel hospital beds occupied by patients with influenza and the rate of Flutracking respondents absent from normal duties, is low.

Absenteeism

- **Flutracking:** In weeks 37 and 38, 1.01% of Flutracking survey respondents respectively reported having ILI and taking time off regular duties while unwell, a decrease from the previous week of 1.22%. This is lower than the 5 year average for the same period.

Use of hospital beds

- **FluCAN:** In the past fortnight, 1.0% of beds available in FluCAN hospitals were occupied with patients with confirmed influenza, compared to 2.06% in the previous fortnight and a high of 6.7% in the fortnight ending on week 28. This is within the range of the rate of influenza admissions per 1,000 available hospital beds in the past 5 years. However, it is likely that a number of hospitals may have a backlog of cases, and it is expected that numbers for the past fortnight may be revised upwards.

4. Virology

National notification data

- **NNDSS:** In the reporting fortnight, 61.4% of notifications of laboratory confirmed influenza to the NNDSS were influenza A (59.4% influenza A(unsubtyped), <1% influenza A(H1N1)pdm09 and 1.92% influenza A(H3N2)), 38.4% were influenza B and less than 1% were influenza A&B co-infections or untyped (Figure 9).

- For the year to 22 September 2019, 77.4% of notifications of laboratory confirmed influenza to the NNDSS were influenza A (72.5% influenza A(untypeded), 3.9% influenza A(H3N2) and less than 1% were influenza A(H1N1)pdm09), 22.4% were influenza B, and less than 1% were influenza A&B co-infections or untyped. The proportion of all notifications year to date reported as influenza A has ranged across jurisdictions from 72.8% in WA to 89.6% in TAS (Figure 10).

Reference Laboratory data

- World Health Organization Collaborating Centre for Reference and Research on Influenza (WHOCC):** From 1 January to 22 September 2019, the WHOCC characterised 3,848 influenza viruses. Of these, 89% were influenza A (60% influenza A(H3N2) and 29% influenza A(H1N1)pdm09) and 11% were influenza B (10% influenza B Victoria lineage and 1% influenza B Yamagata lineage).

Sentinel laboratory surveillance

- In the reporting fortnight, 63.2% of influenza positive samples detected in sentinel laboratories were influenza A (58.6% were influenza A(untypeded), 4.3% were influenza A(H3N2), less than 1% were influenza A(H1N1)pdm09) and 38.5% were influenza B (Figure 11). This is an increase in the proportion attributed to influenza B compared to the previous fortnight (36.5%).

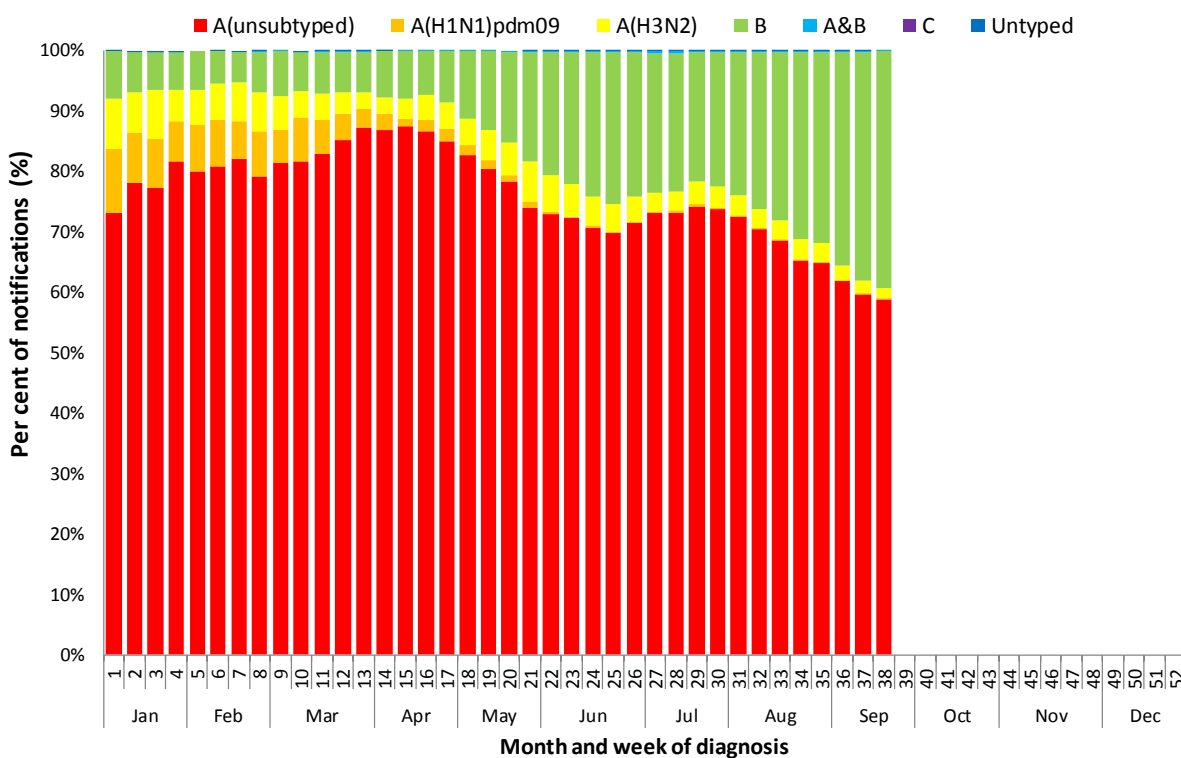
Sentinel GP surveillance

- ASPREN:** Of the 15 influenza positive samples detected this fortnight through swab testing patients presenting with ILI to ASPREN sentinel GPs, 10 (66.7%) were influenza A (untypeded) and none were influenza A(H3N2 or influenza A(H1N1)pdm09). The remaining 5 (33.3%) were influenza B (Figure 12).

Sentinel hospital surveillance

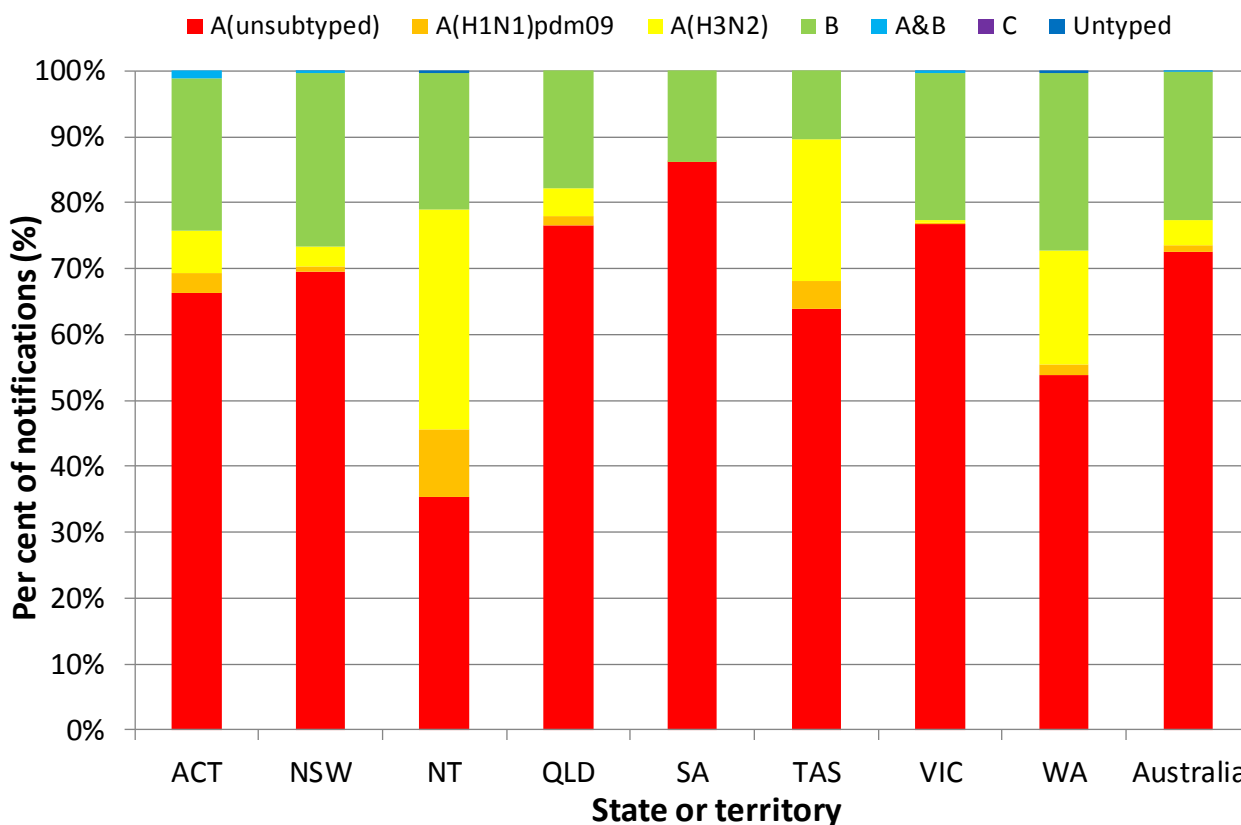
- FluCAN:** Since seasonal sentinel hospital surveillance began on 1 April 2019, 84.7% of admissions with confirmed influenza to sentinel hospitals were influenza A (55.4% influenza A(untypeded), 23.6% influenza A (H3N2) and 5.7% influenza A(H1N1) pdm09), 15.2% were influenza B (Figure 13) and less than 1% were multiple strains. Of the 237 patients admitted directly to ICU, 213 patients were infected with influenza A (55.3% influenza A(untypeded), 22.4% influenza A(H3N2) and 12.2% influenza A(H1N1)pdm09), and 24 people were infected with influenza B (10.1%).

Figure 9. Per cent of laboratory confirmed influenza, Australia, 1 January to 22 September 2019 by subtype and week.



Source: NNDSS

Figure 10. Per cent of notifications of laboratory confirmed influenza, Australia, 1 January to 22 September 2019, by subtype and state or territory.



Source: NNDSS

Figure 11. Proportion of sentinel laboratory tests positive for influenza and total number of specimens tested, 1 January to 22 September 2019, by subtype and month and week.

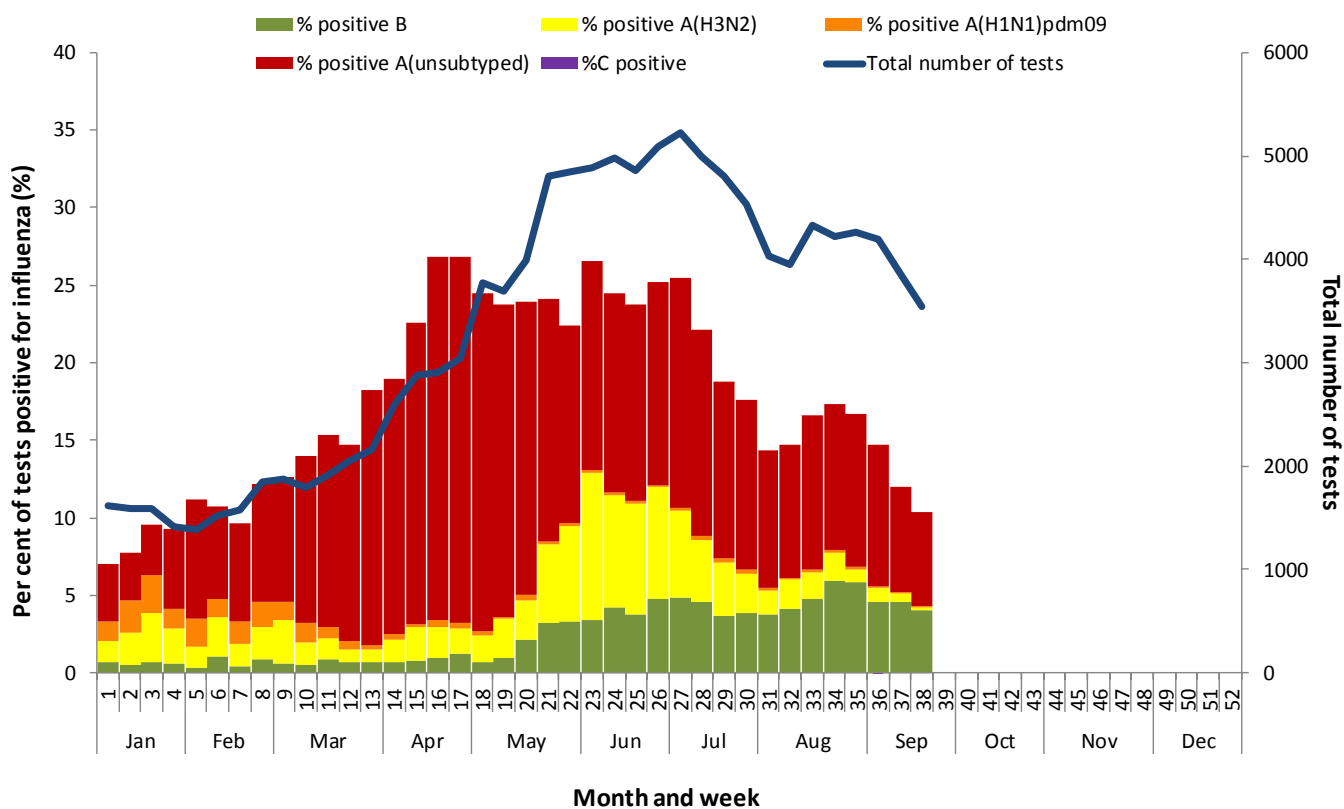
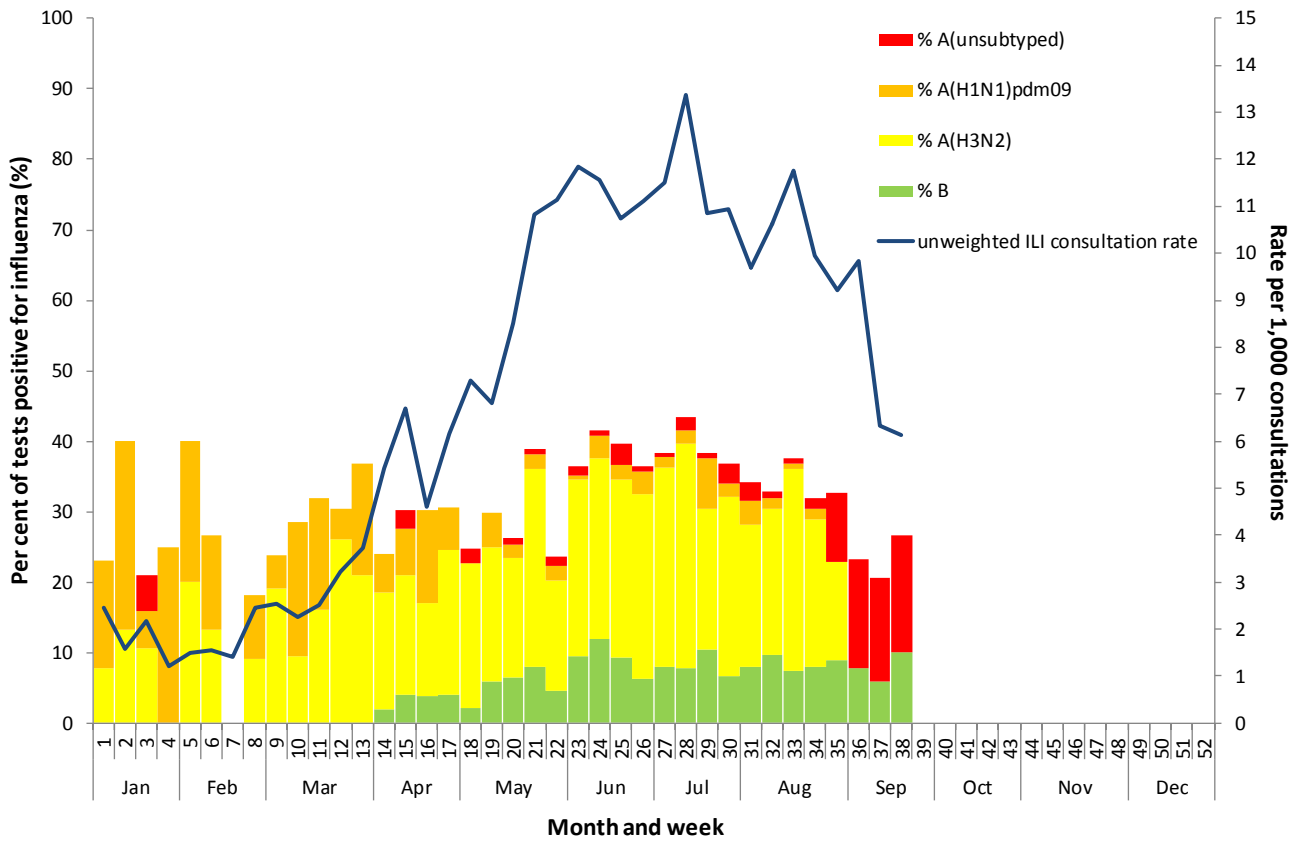
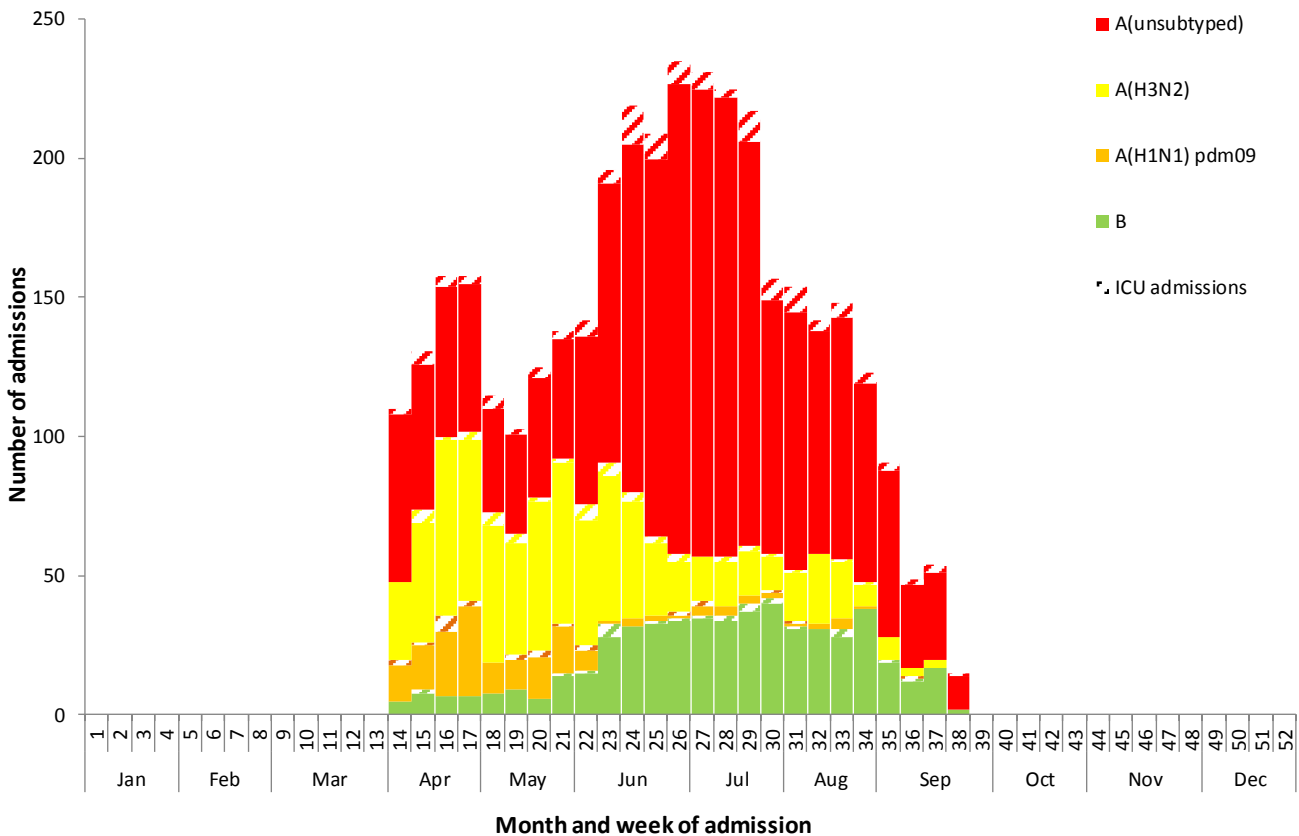


Figure 12. Proportion of respiratory viral tests positive for influenza in ASPREN ILI patients and ASPREN ILI consultation rate, Australia, 1 January to 22 September 2019, by month and week.



Source: ASPREN

Figure 13. Number of influenza hospitalisations at sentinel hospitals by subtype and ICU admission, 1 April to 22 September 2019, by month and week.



Source: FluCAN

5. At-risk Populations

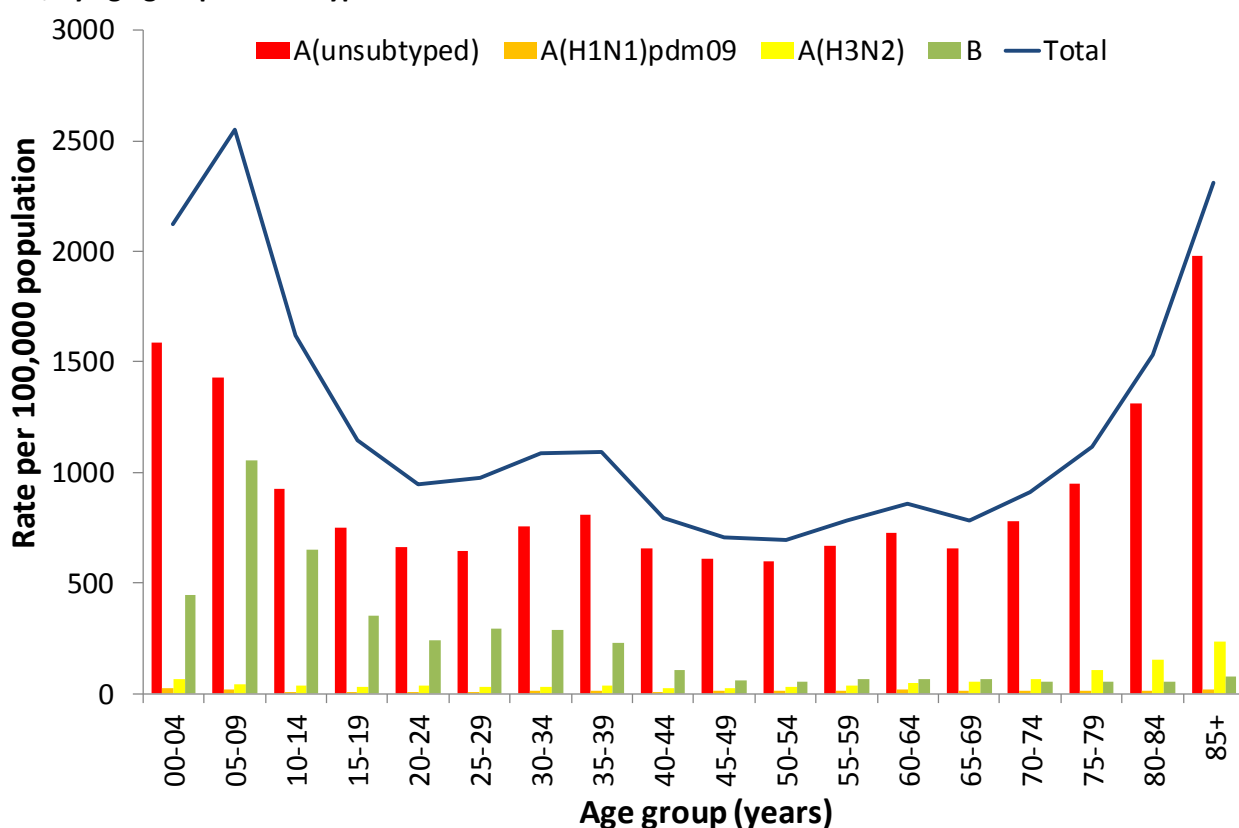
National notification data

- **NNDSS:** In the year to date, notification rates were highest in children aged between 5 and 9 years of age (2,550.4 notifications per 100,000) followed by adults aged over 85 years (2,311.1 notifications per 100,000) (Figure 14).
- In the year to date, influenza A accounted for the greatest number of notifications across all age groups. Where further subtyping was available, notification rates of influenza A(H1N1)pdm09 were highest in children aged less than 4 years (23.9 notifications per 100,000) and notifications of influenza A(H3N2) were highest in adults aged 85 years and older (235.9 notifications per 100,000). Notification rates for influenza B were highest in children aged 5 to 9 years (1,056.4 notifications per 100,000).
- Among broader age groups, where subtyping information was available, influenza A (H3N2) was the predominant strain in all age groups. Influenza B was most common in those aged 5 to 19 years (Figure 15).
- In the past fortnight, notification rates were highest in children aged between 5 and 9 years (148.0 notifications per 100,000), followed by adults over 85 years of age (125.2 notifications per 100,000).
- In the past fortnight, influenza A has also accounted for the greatest number of notifications across all age groups, with rates according to subtypes mirroring those in the year to date.

Sentinel hospital surveillance

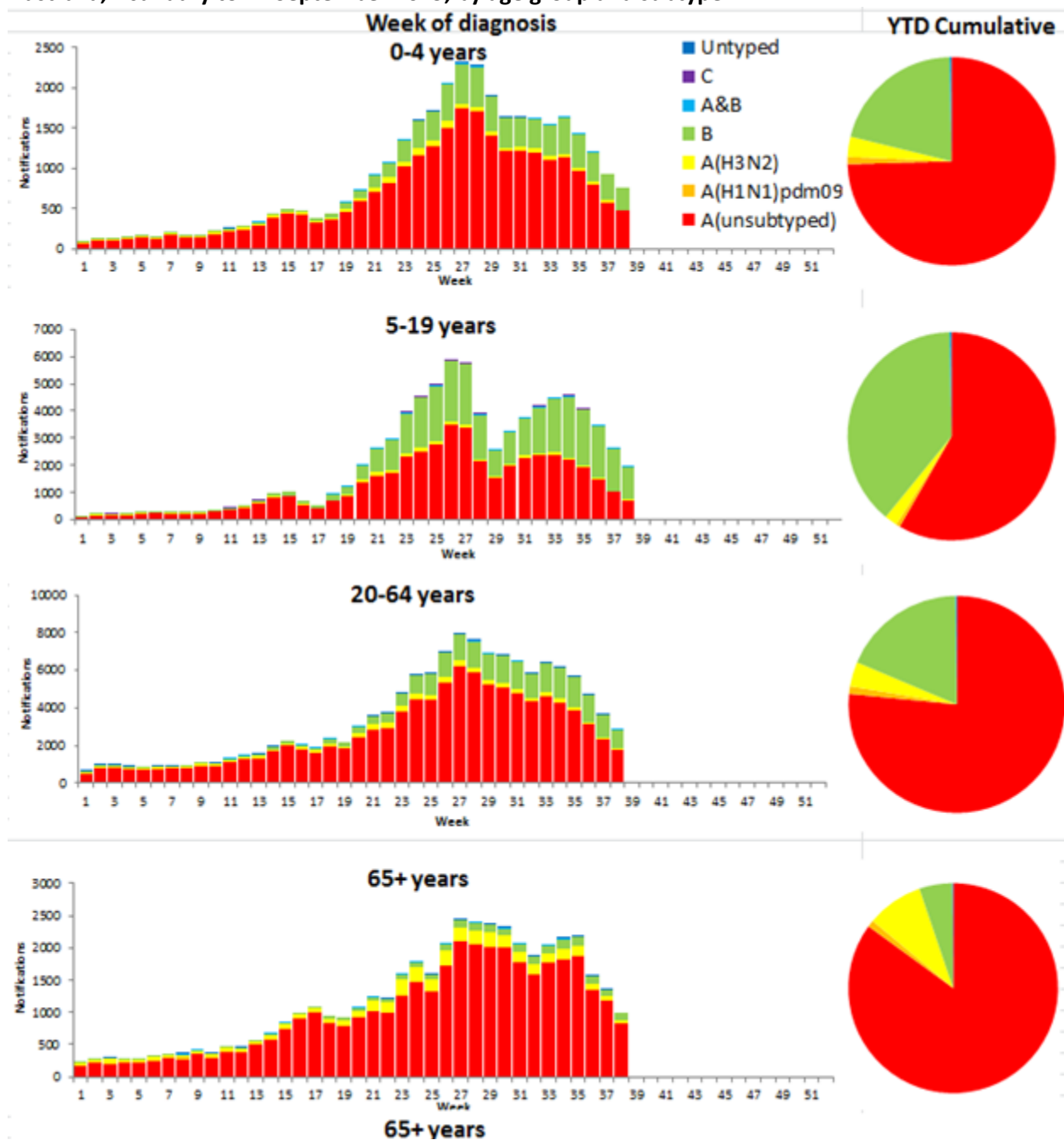
- **FluCAN:** Since seasonal sentinel hospital surveillance began on 1 April 2019, 28.9% of people admitted with confirmed influenza were children aged 15 years and younger, 31.3% were adults aged between 16 and 64 years, and 39.8% were adults aged 65 years and older. Of the children admitted with confirmed influenza to date, 5.4% (n=58) were admitted to ICU, compared to 8.6% of adults aged between 16 and 64 years and 5.3% of adults aged 65 years and older.

Figure 14. Rate of notifications of laboratory confirmed influenza, Australia, 1 January to 22 September 2019, by age group and subtype.



Source: NNDSS

Figure 15. Notifications of laboratory confirmed influenza by week of diagnosis and cumulative year-to-date, Australia, 1 January to 22 September 2019, by age group and subtype



Source: NNDSS

6. Vaccine effectiveness

Australian Influenza Vaccines Composition 2019

The influenza virus strains included in the 2019 seasonal influenza vaccines in Australia are:

- A/Michigan/45/2015, (H1N1)pdm09-like virus;
- A/Switzerland/8060/2017, (H3N2)-like virus; and
- B/Phuket/3073/2013-like virus, Yamagata lineage.
- B/Colorado/06/2017-like virus, Victoria lineage.

The best way to determine how well the vaccine protects against circulating viruses during the season is by determining the vaccine effectiveness. These estimates provide an indication of how effective the vaccine was in providing protection against influenza infection. Vaccine effectiveness is usually estimated from observational studies and is calculated after the end of the influenza season, though interim analyses are sometimes available where there is sufficient data. Antigenic characterisation, as presented below, provides

an estimate of the match of circulating influenza viruses to components of the vaccines utilised in the 2019 influenza season.

WHOCC

From 1 January to 23 September 2019, 1,502 isolates were characterised for similarity to their corresponding vaccine components by haemagglutination inhibition (HI) assay (Table 1). Most influenza A(H1N1)pdm09 viruses and influenza B/Yamagata viruses appeared to be antigenically similar to the corresponding vaccine components. Twenty-one A(H1N1)pdm09 and one B/Yamagata viruses were characterised as low reactors. The majority of influenza A(H3N2) and B/Victoria isolates that were able to be assessed by HI assay appeared to be antigenically matched to the vaccine. Of the 636 influenza A(H3N2) isolates, 135 (21%) were characterised as low reactors, and an additional 245 isolates were unable to be characterised in the HI assay due to insufficient haemagglutination titre. Of the 188 influenza B/Victoria isolates, 38 (20%) were characterised as low reactors.

Table 1. Australian influenza viruses typed by HI from the WHOCC, 1 January to 23 September 2019.

Type/Subtype	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	TOTAL
A(H1N1) pdm09	70	210	48	67	87	12	131	27	652
A(H3N2)	69	118	109	32	86	47	132	43	636
B/Victoria lineage	34	42	26	23	11	2	32	18	188
B/Yamagata lineage	4	6	2	1	9	0	1	3	26
Total	177	376	185	123	193	61	296	91	1502

SOURCE: WHO CC

Note: Viruses tested by the WHO CC are not necessarily a random sample of all those in the community. State indicates the residential location for the individual tested, not the submitting laboratory. There may be up to a month delay on reporting of samples.

Vaccine effectiveness

The protective effect of influenza vaccines against influenza and complications, known as vaccine effectiveness, is monitored by several sentinel influenza surveillance systems in Australia. This varies from season to season based on the match between the strains in the vaccine to circulating strains, but typically is around 40-60%. Overall in 2019, vaccine effectiveness appears good and as expected based on preliminary estimates from general practice (ASPREN) and sentinel hospitals (FluCAN-PAEDS).

7. Antiviral Resistance

The WHOCC reported that from 1 January to 22 September 2019, one of the 2,061 influenza viruses tested for neuraminidase inhibitor resistance, demonstrated highly reduced inhibition to Oseltamivir and one demonstrated highly reduced inhibition to Zanamivir.

8. Data considerations

This report presents an overview of influenza activity based on a number of complimentary systems. 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 notifiable diseases data, which includes officially reported deaths. The information in this report is reliant on the surveillance sources available to the Department of Health at the time of production.

Data in this summary is reported by International Organization for Standardization (ISO) 8601 weeks, with the week ending on Sunday. Throughout the summary, where the year to date is presented, this includes data from 1 January to 22 September 2019. NNDSS data were extracted on 26 September 2019. 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. Detailed notes on interpreting the data presented in this report are available at the Department of Health's [Australian Influenza Surveillance Report website](http://www.health.gov.au/flureport) (www.health.gov.au/flureport).

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