



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

KEY MESSAGES

- Nationally, influenza activity is returning to baseline levels, however seasonal activity persists in some regions.
- Nationally, and in most jurisdictions, the seasonal peak of laboratory confirmed notifications of influenza occurred in the fortnight ending 2 September 2016 (week 34 and 35). Notifications peaked two weeks later in South Australia and four weeks later in the Northern Territory. Notifications have decreased this reporting fortnight, however are higher than at the same time in recent years. This is likely driven by a later season onset and persistent regional activity.
- Throughout the season national indicators of influenza-like illness (ILI) in the community remained on the lower range of activity reported in previous years until late September, when they were at the higher end of the historical range. National indicators of ILI in the community continued to decline this fortnight and have reached baseline levels. Rhinovirus was the primary cause of ILI presentations to sentinel general practitioners this fortnight.
- The 2016 season was characterised by the dominant circulation of influenza A. Early interseasonal activity was driven by influenza A(H1N1)pdm09, with influenza A(H3N2) predominating throughout the season from July.
- Notification rates this year to date have been highest in adults aged 75 years or older, with a secondary, smaller peak in the very young, aged less than 5 years. This is consistent with influenza A(H3N2) being typically more prevalent in older age groups.
- There were fewer admissions with confirmed influenza to sentinel hospitals this year than in the past two years. The overall proportion of patients admitted directly to Intensive Care Units (ICUs) was higher than last year, but consistent with a season of moderate severity. Aboriginal and Torres Strait Islander Peoples and pregnant women were identified at greater risk of being admitted to ICU than other admitted patients this season.
- To date, the seasonal influenza vaccines appear to be a good match for circulating virus strains.
- This will be the final Australian Influenza Surveillance Report for 2016, unless unusual activity becomes apparent over the summer months.

ANALYSIS

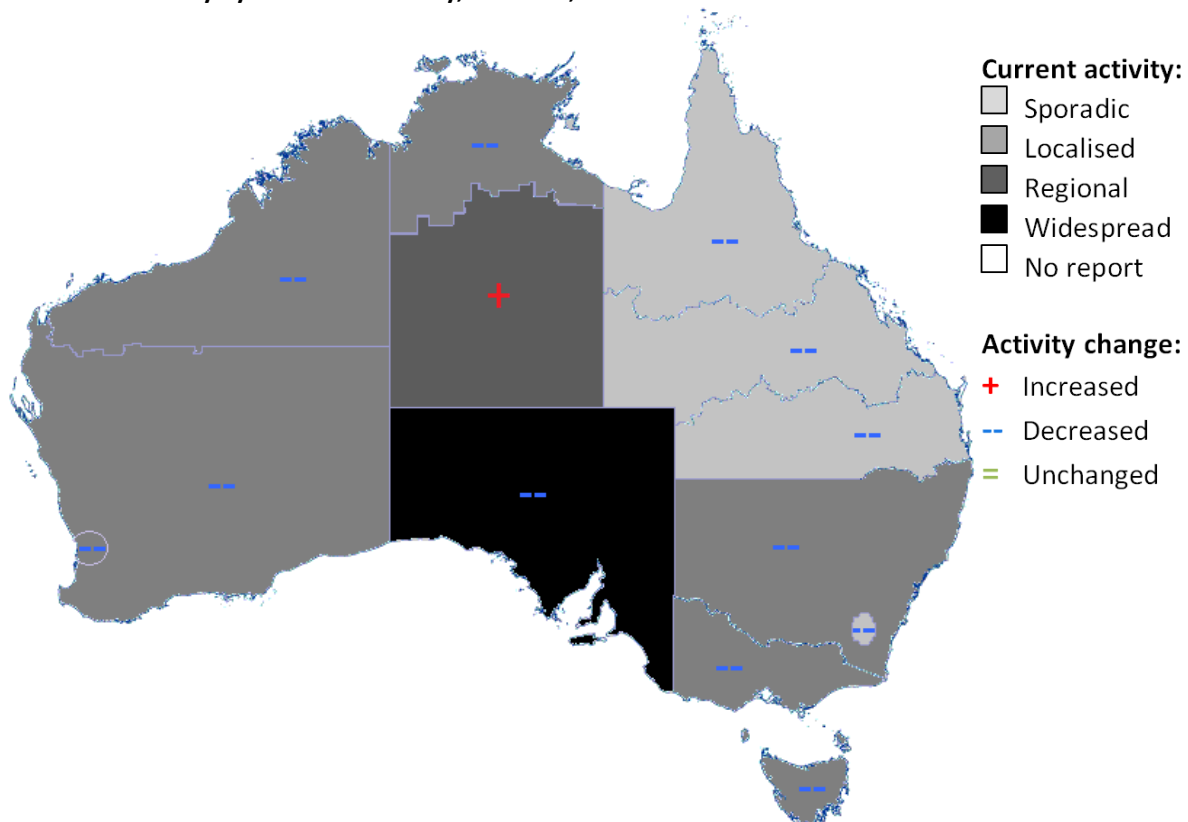
1. Geographic Spread of Influenza Activity in Australia

In the fortnight ending 28 October 2016 (week 43), influenza activity was reported by state and territory health departments as decreased in all regions, except in the Central Australia region of the Northern Territory (NT) where activity increased when compared with the previous fortnight (Figure 1).

The geographic spread of influenza activity was reported as widespread in South Australia (SA); regional in the Central Australia region of the NT; localised in all other regions with the exception of the Australian Capital Territory (ACT) and all regions of Queensland (QLD) where the geographic spread of influenza activity was sporadic.

Influenza-like illness (ILI) activity reported from syndromic surveillance systems when compared with the previous fortnight was reported as decreased in all states and territories of Australia.

Figure 1. Map of influenza activity by state and territory, Australia, 15 – 28 October 2016.

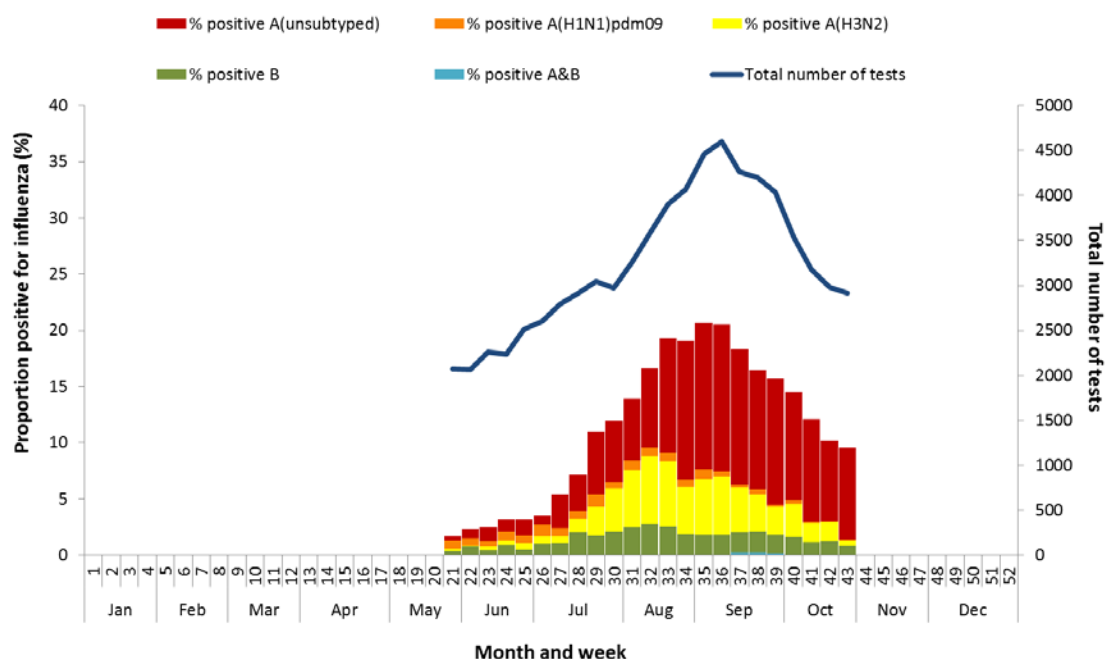


2. Laboratory Confirmed Influenza Activity

Sentinel Laboratory Surveillance

Influenza was detected by sentinel laboratories at decreasing levels over the reporting fortnight. The percentage of tests positive for influenza across all sentinel laboratories was 9.5% in week 43, a decrease from 10.2% in week 42; continuing the decline from the peak in week 35 of 20.7% (Figure 2). Respiratory viruses other than influenza, in particular rhinovirus, were most commonly detected by most sentinel laboratories this fortnight.

Figure 2. Proportion of sentinel laboratory tests positive for influenza, 21 May to 28 October 2016, by subtype and month and week.



Participating sentinel laboratories: National Influenza Centres (NSW, VIC, WA) and TAS* and SA^ public laboratories.
 *PCR testing only; ^Reporting period ends on a Sunday.

Notifications of Influenza to Health Departments

Notifications of laboratory confirmed influenza to the National Notifiable Diseases Surveillance System (NNDSS) have decreased this reporting fortnight, however are higher than notifications reported at the same time in recent years (Figure 3). Notifications of laboratory confirmed influenza continued to decline in most states and territories this reporting fortnight with the exception of the ACT and SA where notifications increased slightly from week 42 to 43. For the year to 28 October, a total of 83,092 notifications of laboratory confirmed influenza were reported to the NNDSS: 33,826 in New South Wales (NSW); 21,358 in QLD; 11,230 in Victoria (VIC); 7,454 in Western Australia (WA); 6,103 in South Australia (SA); 1,555 in ACT; 967 in Tasmania (TAS) and 599 in the NT.

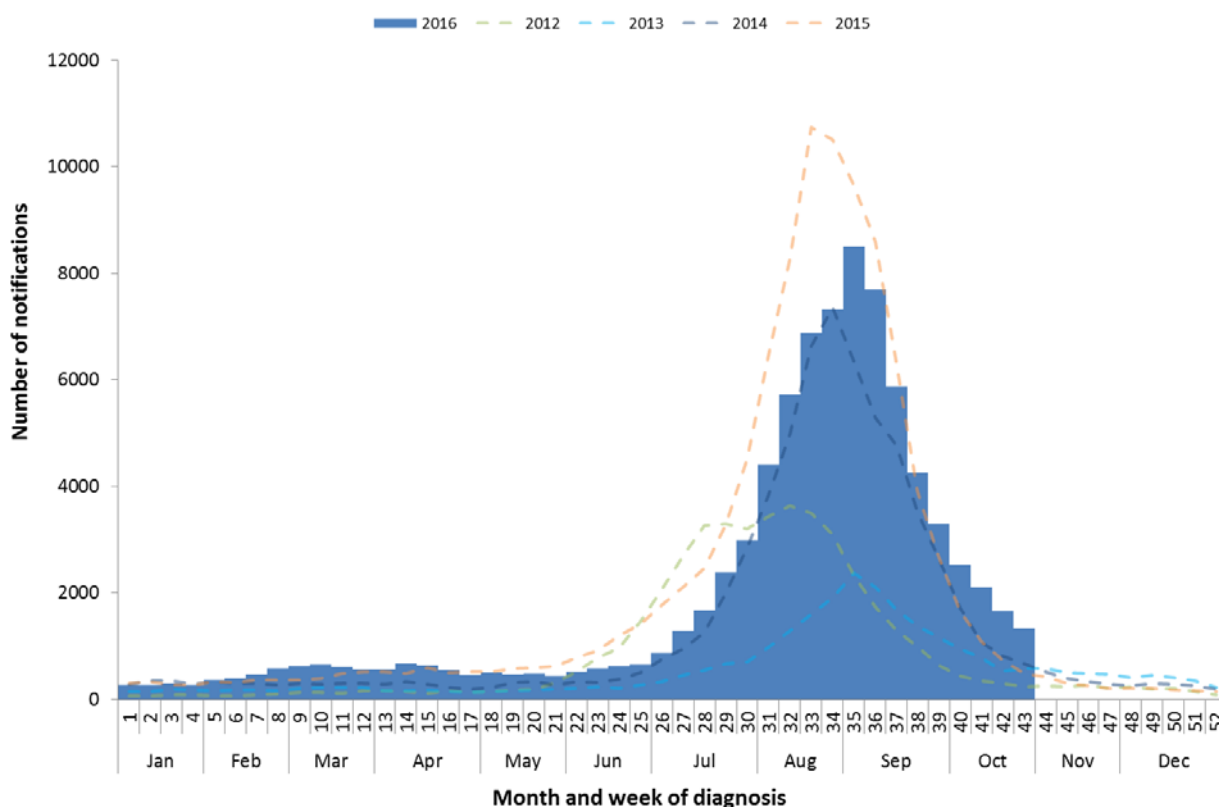
There were unusually high levels of notifications reported to the NNDSS in the interseasonal period throughout March and early April, however notifications returned to baseline levels until the seasonal rise in notifications commenced nationally in early July. A peak in notifications was reached in the week ending 2 September (week 35), with 8,496 notifications reported nationally. Local peaks in jurisdictions mostly occurred in weeks 34 and 35, with the exception of NT and SA where the peaks were later, in weeks 39 and 37 respectively (Figure 4).

For the year to 28 October, 90% of notifications of laboratory confirmed influenza to the NNDSS were influenza A (73% A(untypeded), 6% influenza A(H1N1)pdm09 and 11% influenza A (H3N2)), 10% were influenza B and less than 1% were influenza C, influenza A&B co-infections or untyped (Figure 5). In the most recent fortnight, 85% of notifications of laboratory confirmed influenza to the NNDSS were influenza A (77% influenza A(untypeded), 1% influenza A(H1N1)pdm09 and 8% influenza A (H3N2), 14% were influenza B and less than 1% were influenza A&B co-infections or untyped.

Influenza A has dominated throughout the season, however early interseasonal activity was driven by influenza A(H1N1)pdm09, with notifications due to influenza A(H3N2) increasing from July. Most jurisdictions had a similar distribution of influenza A and B for the year as a whole. However, TAS saw more notifications due to influenza A (96%) and WA saw fewer (70%, Figure 6).

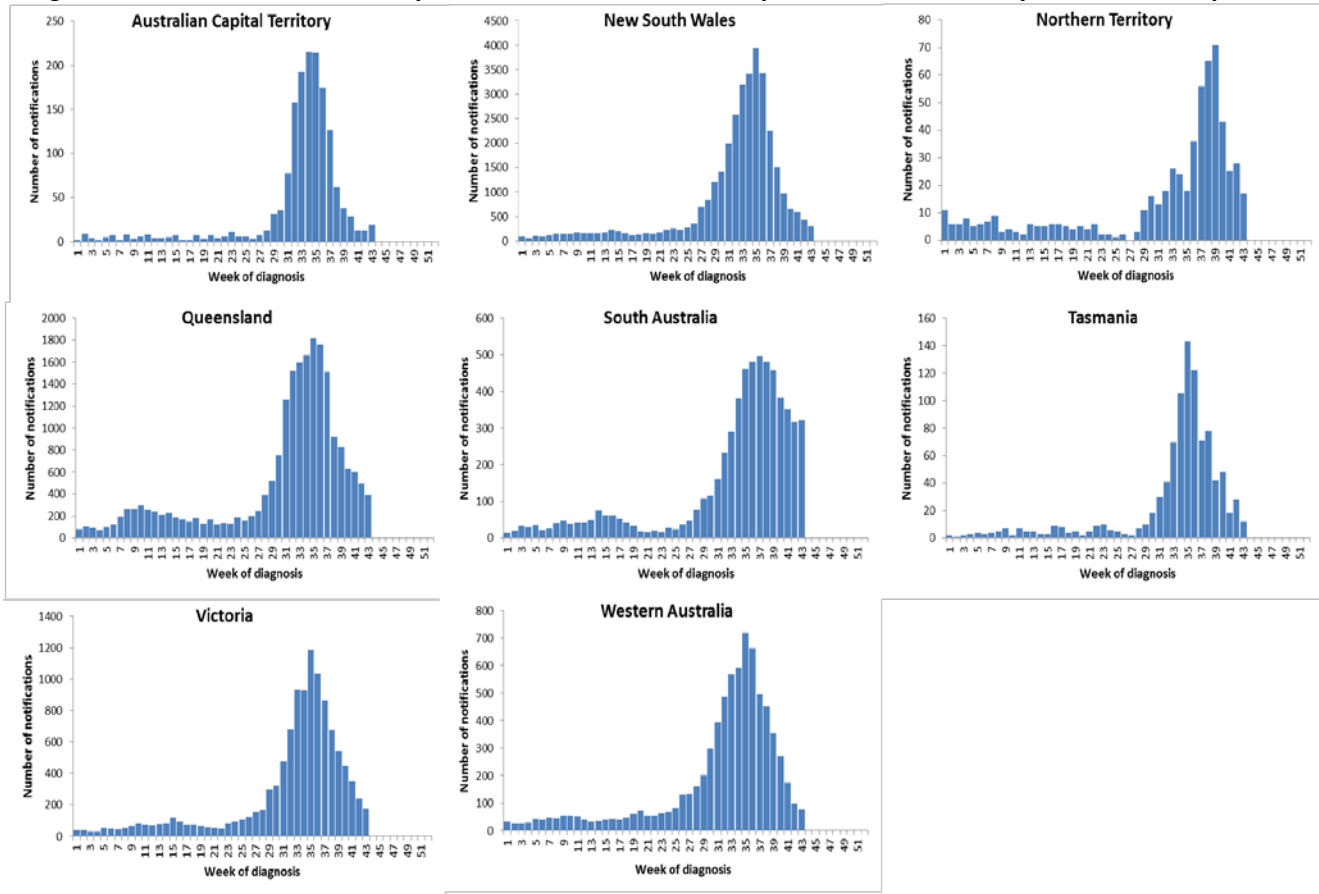
Notification rates were highest in adults aged 75 years or older (773 notifications per 100,000 population), with a secondary smaller peak in the very young, aged less than 5 years (512 notifications per 100,000 population; Figure 7). In 2016 year to date, while influenza A(H3N2) was detected across all age groups, it accounted for a greater proportion of influenza A where subtyping is available in adults aged 65 years or older, than in any other age group (Figure 8).

Figure 3. Notifications of laboratory confirmed influenza, Australia, 1 January 2012 to 28 October 2016, by month and week of diagnosis.



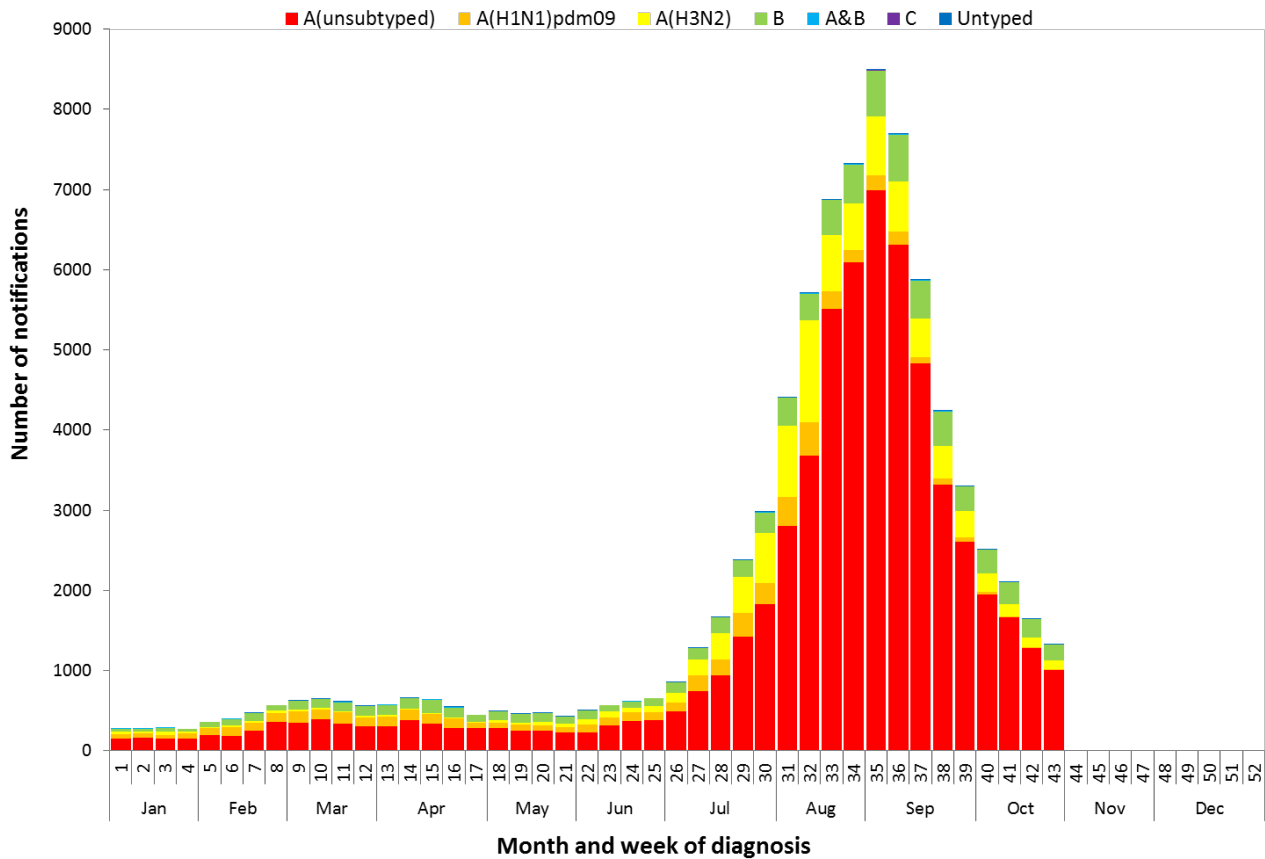
Source: NNDSS

Figure 4. Notifications of laboratory confirmed influenza, 2 January to 28 October 2016, by state or territory and week.



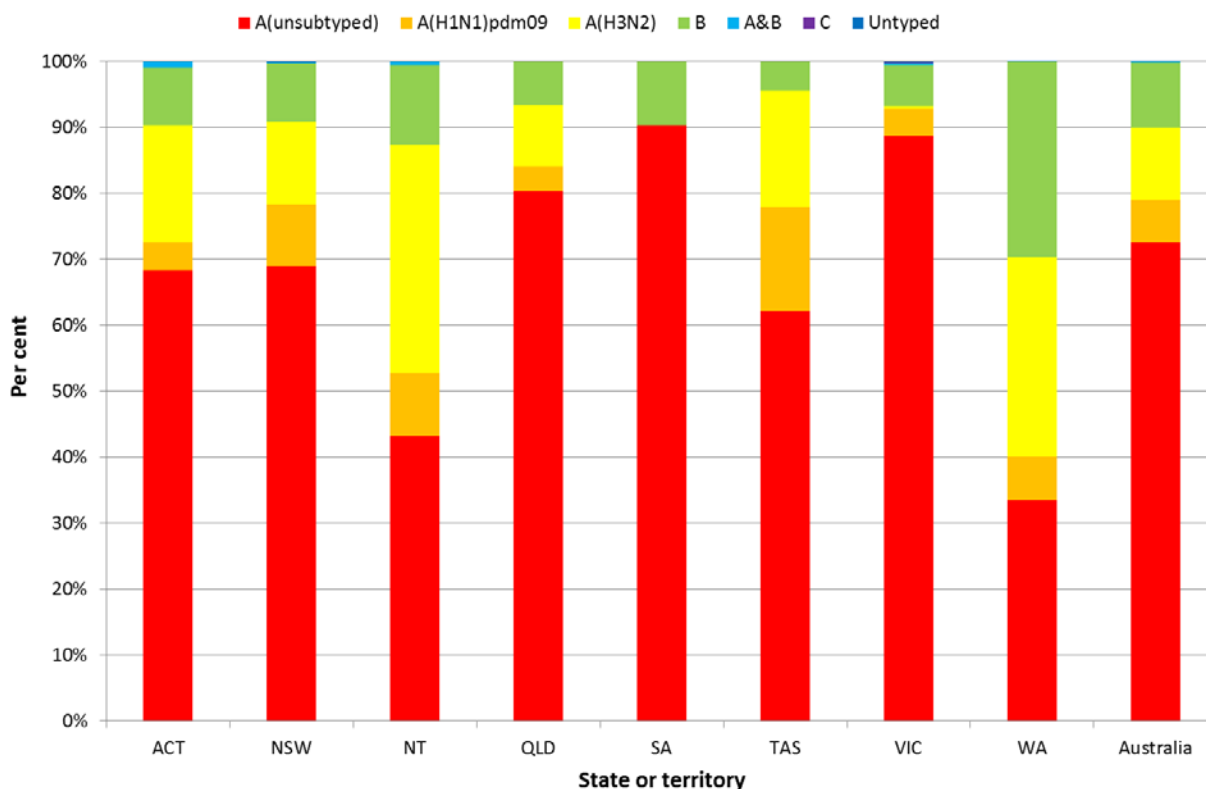
Source: NNDSS

Figure 5. Notifications of laboratory confirmed influenza, Australia, 2 January to 28 October 2016, by subtype and week.



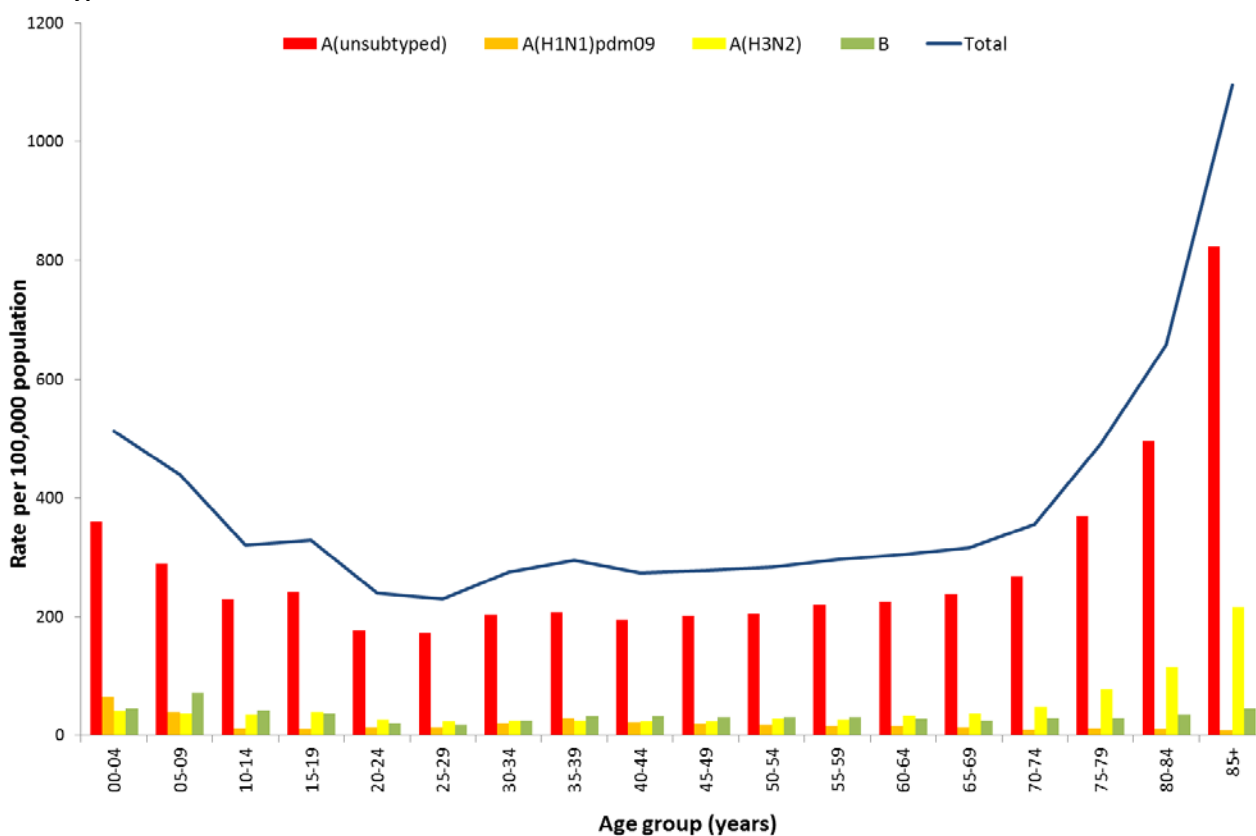
Source: NNDSS

Figure 6. Per cent of notifications of laboratory confirmed influenza, Australia, 1 January to 28 October 2016, by subtype and state or territory.



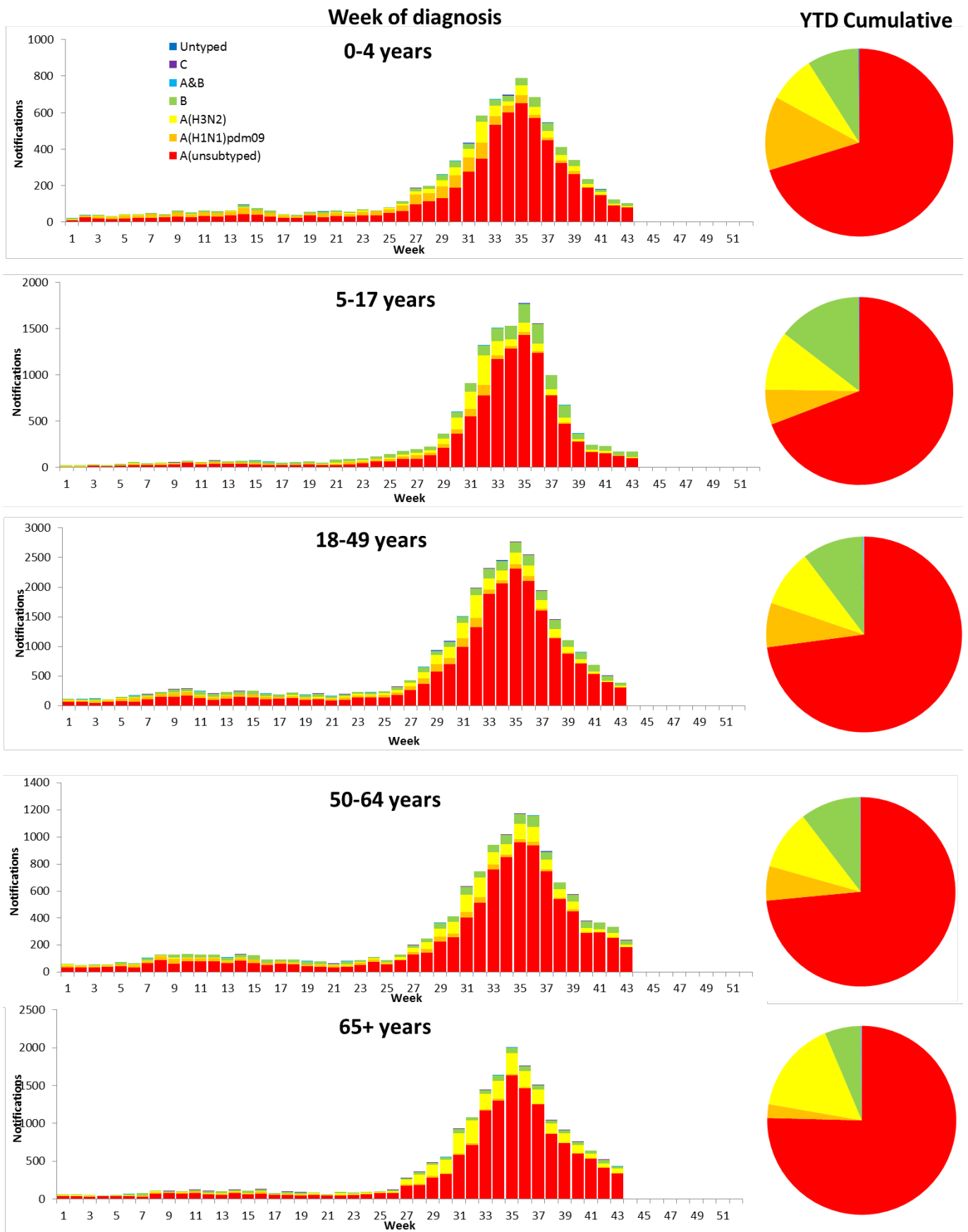
Source: NNDSS

Figure 7. Rate of notifications of laboratory confirmed influenza, Australia, 1 January to 28 October 2016, by age group and subtype.



Source: NNDSS

Figure 8. Notifications of laboratory confirmed influenza by week of diagnosis and cumulative year to date, Australia, 2 January to 28 October 2016, by age group and subtype.



Source: NNDSS

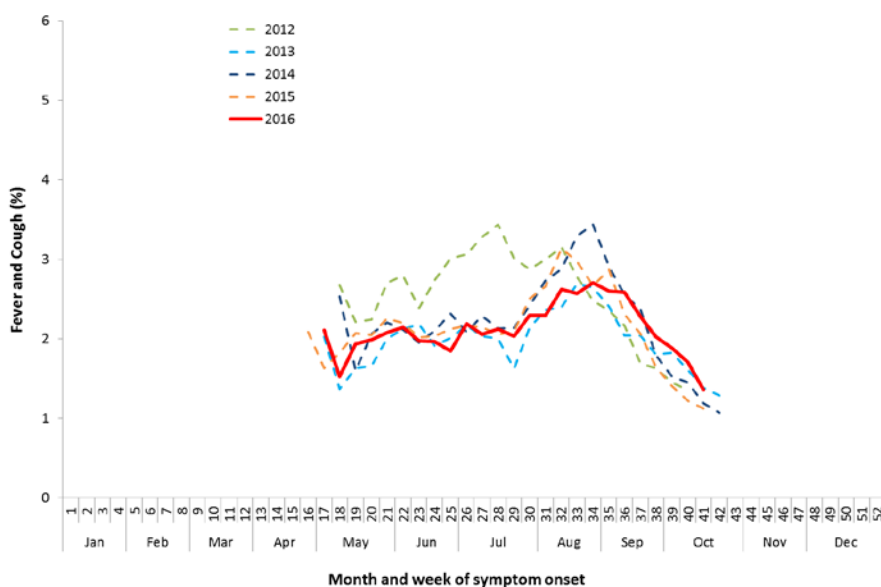
3. Influenza-like Illness Activity

Community Level Surveillance

There are no new data to present this report as surveillance through the FluTracking system ceased for the 2016 season on 16 October. ILI among FluTracking participants began to increase in mid-July and reached a plateau between weeks 32 and 36, rather than the sharper seasonal peaks reported in recent years (Figure 9). ILI activity remained on the lower range of activity reported in previous years throughout the season until late September, when it was at the higher range reported at the same time in previous years.

This year 61% of all participants and 80% of participants who identify as working face-to-face with patients reported receiving the seasonal influenza vaccine.¹

Figure 9. Proportion of fever and cough among FluTracking participants, Australia, between May and October, 2012 to 2016, by month and week.



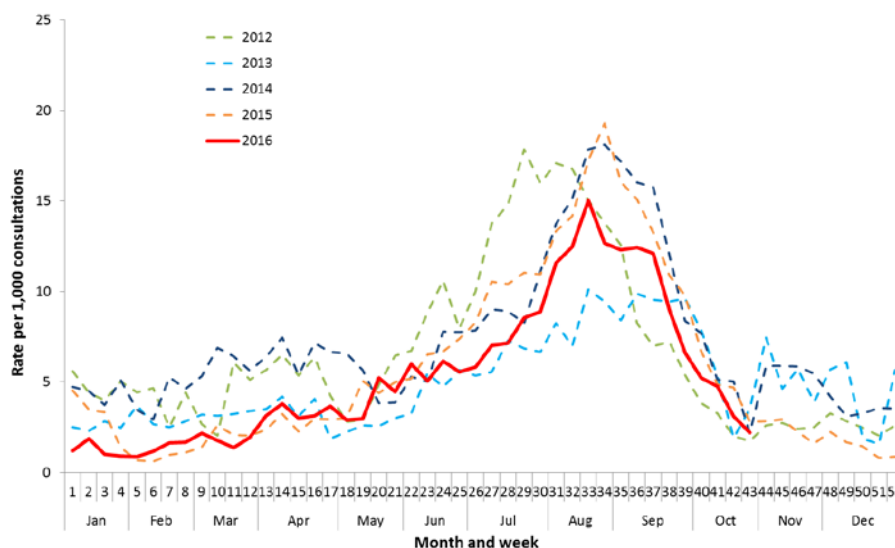
Source: FluTracking

Sentinel General Practice Surveillance

Sentinel general practitioner ILI consultations reached baseline levels this fortnight, decreasing from 3.1 per 1,000 consultations in week 42 to 2.2 per 1,000 consultations in week 43 (Figure 10). This continues a decline from the peak reached in week 33 of 15.0 ILI consultations per 1,000 consultations. The pattern of ILI presentations to sentinel general practitioners in 2016 followed the pattern seen in previous years, with the exception of 2012 when the peak in activity occurred approximately one month earlier.

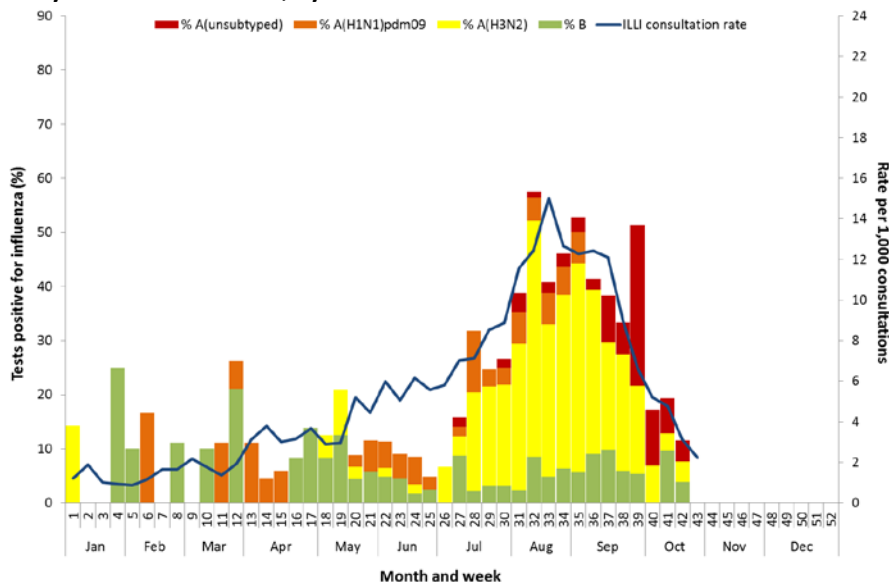
Of the 38 specimens taken from ILI patients seen by a sentinel practitioner during the current reporting fortnight, 3 (8%) were positive for influenza, with influenza A(H3N2) and influenza B detected at similar levels (Figure 11). Rhinovirus was the most common respiratory virus detected this fortnight (21%).

Figure 10. Unweighted rate of ILI reported from sentinel GP surveillance systems, Australia, 1 January 2012 to 30 October 2016, by month and week.



SOURCE: ASPREN and VicSPIN

Figure 11. Proportion of respiratory viral tests positive for influenza in ASPREN ILI patients and ASPREN ILI consultation rate, Australia, 4 January to 30 October 2016, by month and week.



SOURCE: ASPREN

4. Hospitalisations

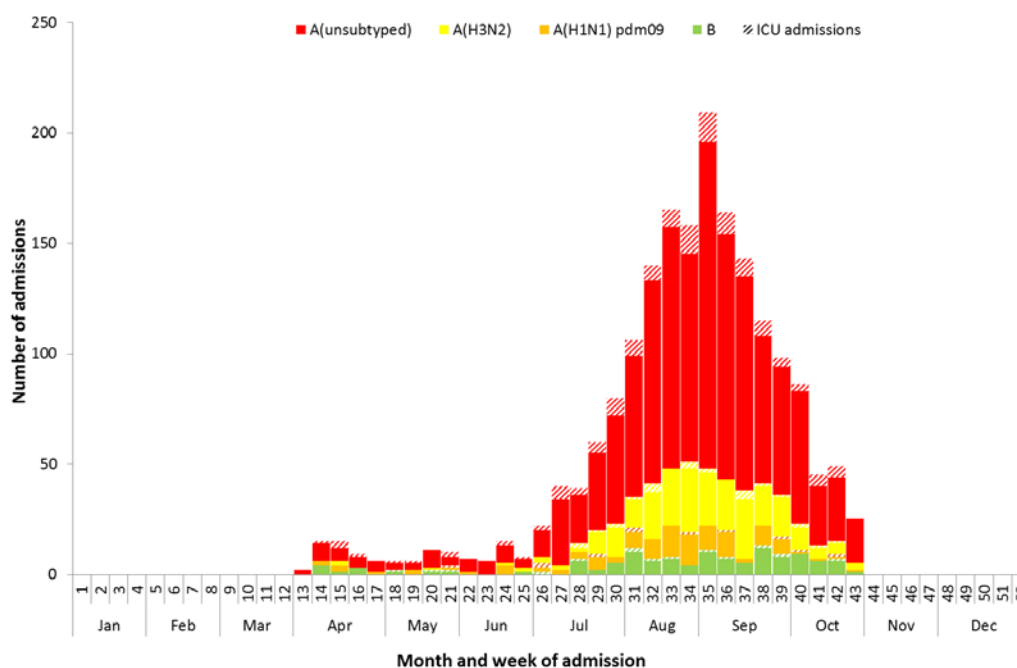
Sentinel Hospital Surveillance

Admissions with confirmed influenza to sentinel hospitals declined from week 42 to 43; continuing the decline from the peak in week 35 (Figure 12). Since seasonal surveillance commenced through the Influenza Complications Alert Network (FluCAN) sentinel hospital surveillance system on 1 April 2016, a total of 1,860 people have been admitted with confirmed influenza. This is fewer than the number of admissions reported last year (n=2,070). Of the 2016 admissions, 344 (18%) were children aged less than 15 years and 845 (45%) were adults aged 65 years or older.

Approximately 10% of influenza patients have been admitted directly to the Intensive Care Unit (ICU); this indicator was similar for admissions due to influenza B (11%) and influenza A (9%). A higher proportion of Aboriginal and Torres Strait Islander Peoples (16%) and pregnant women (15%) were admitted directly to the ICU.

Consistent with other systems, the majority of influenza admissions have been due to influenza A (93%). Overall, 74% of patients were reported with significant risk factors, with the presence of risk factors increasing with age.

Figure 12. Number of influenza hospitalisations at sentinel hospitals, 1 April to 28 October 2016, by month and week of and influenza subtype.



Source: FluCAN Sentinel Hospitals

Paediatric Severe Complications of Influenza

There are no new data to present this report as surveillance of children aged 15 years and under who are hospitalised with severe complications of influenza through the Australian Paediatric Surveillance Unit (APSU) is conducted between July and September. Between 1 July 2016 and 30 September 2016, there were 21 hospitalisations associated with severe complications of influenza reported to APSU. This is fewer than the number of hospitalisations reported through the surveillance system in 2015 (n=84) and 2014 (84), but similar to 2013 (n=22).

The median age of the cases reported in 2016 was 1.9 years, which is young when compared with the median age of hospitalised cases in the previous 4 years (range 3-4.7 years).

All but one of the cases was associated with influenza A infection. One-half of the cases reported having an underlying chronic condition; one case was vaccinated for influenza, 10 cases were not vaccinated for influenza and 10 had an unknown vaccination status.

5. Deaths Associated with Influenza and Pneumonia

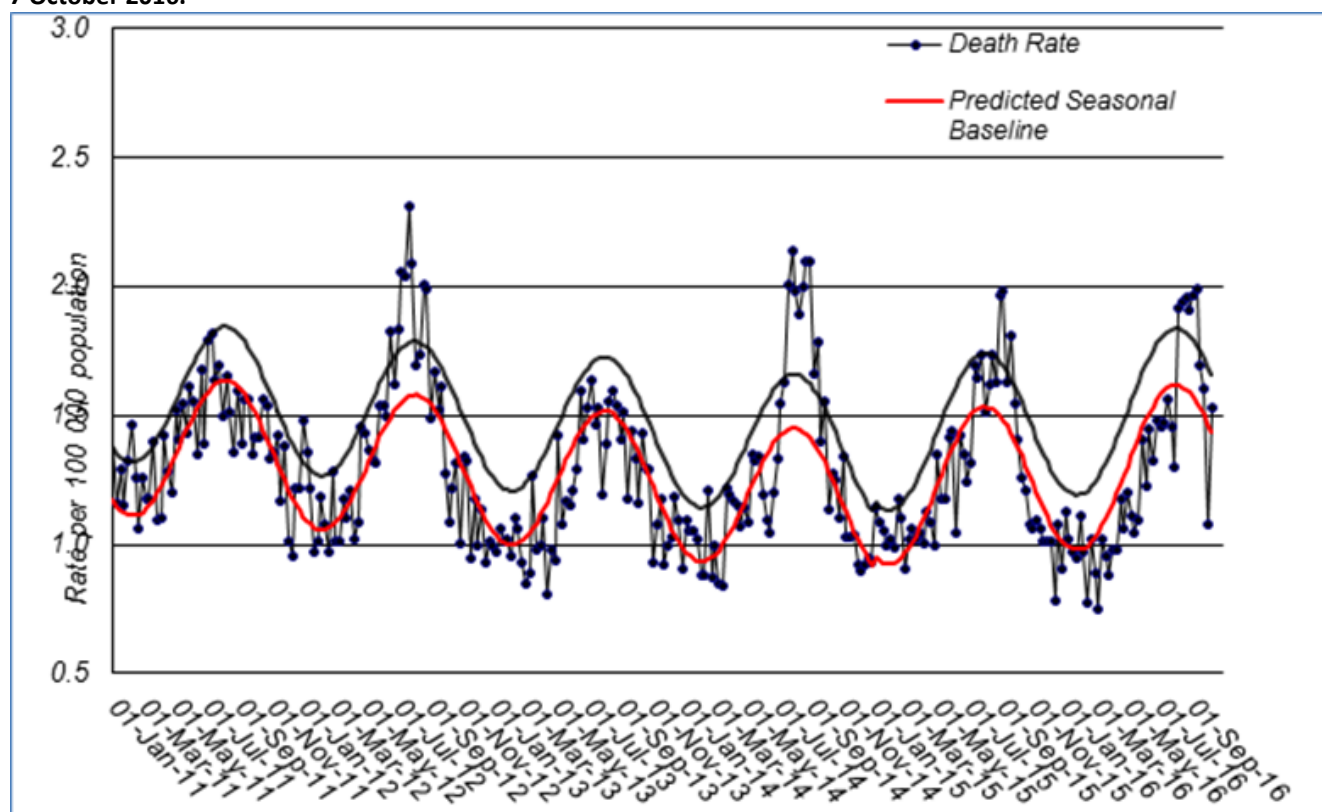
Nationally Notified Influenza Associated Deaths

So far in 2016, 92 influenza associated deaths have been notified to the NNDSS. The majority of deaths were due to influenza A (87%, n = 80). The median age of deaths notified was 80 years (range 0 to 99 years). The number of influenza associated deaths reported to the NNDSS is reliant on the follow up of cases to determine the outcome of their infection and most likely does not represent the true mortality associated with this disease.

New South Wales Influenza and Pneumonia Death Registrations

Death registration data from NSW for the week ending 7 October 2016 show that there were 1.53 “pneumonia and influenza” deaths per 100,000 NSW population, which was below the epidemic threshold of 1.66 per 100,000 NSW population (Figure 13).²

Figure 13. Rate of deaths classified as influenza and pneumonia from the NSW Registered Death Certificates, 2011 to 7 October 2016.



Source: NSW Registry of Births, Deaths and Marriages

6. Virological Surveillance

Australian Influenza Vaccines Composition 2016

The influenza virus strains included in the 2016 seasonal influenza vaccines in Australia are:

- A/California/7/2009, (H1N1)pdm09-like virus;

- A/Hong Kong/4801/2014, (H3N2)-like virus;
- B/Brisbane/60/2008-like virus, Victoria lineage;
- B/Phuket/3073/2013-like virus, Yamagata lineage (Quadrivalent influenza vaccine only).

Typing and Antigenic Characterisation

In 2016, up to 2 November the World Health Organization Collaborating Centre for Reference and Research on Influenza (WHOCC) characterised 1,083 influenza viruses (Table 1). When further characterised for similarity to the vaccine components, isolates appeared to be well matched. All the influenza B isolates were characterised as similar to the vaccine components. A small number of influenza A(H1N1)pdm09 isolates (n=31) and influenza A(H3N2) isolates (n=47) were characterised as low reactors.

Table 1. Australian influenza viruses typed by HI from the WHOCC, 1 January to 3 October 2016.

Type/Subtype	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	TOTAL
A(H1N1) pdm09	10	172	14	179	34	63	65	20	557
A(H3N2)	14	119	2	60	37	57	100	17	406
B/Victoria lineage	3	16	1	14	6	0	5	5	50
B/Yamagata lineage	5	18	2	21	5	3	10	6	70
Total	32	325	19	274	82	123	180	48	1083

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.

Antiviral Resistance

The WHOCC reported that from 1 January to 2 November 2016, of the 1,526 influenza viruses tested for neuraminidase inhibitor resistance, three influenza A(H1N1)pdm09 viruses have shown highly reduced inhibition to the antiviral drug Oseltamivir.

7. International Surveillance

The World Health Organization reported that influenza activity in temperate southern hemisphere countries continued to decrease or remained low.³ Influenza activity in the temperate zone of the northern hemisphere remained at inter-seasonal levels.

DATA CONSIDERATIONS

The information in this report is reliant on the surveillance sources available to the Department of Health. As access to sources vary throughout the season, this report will draw on available information.

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).

This report aims to increase awareness of influenza activity 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](mailto:flu@health.gov.au) (flu@health.gov.au).

REFERENCES

- 1 FluTracking, FluTracking Weekly Interim Report, Week ending 2 October 2016. Available from FluTracking Reports (<http://www.flutracking.net/Info/Reports>) [Accessed 7 October 2016].
- 2 Personal communication, Robin Gilmour, Health Protection NSW, NSW Ministry of Health, 3 November 2016.
- 3 WHO, Influenza Update No. 275, 31 October 2016. Available from the [WHO website](http://www.who.int/influenza/surveillance_monitoring/updates/latest_update_GIP_surveillance/en/) (http://www.who.int/influenza/surveillance_monitoring/updates/latest_update_GIP_surveillance/en/) [Accessed 3 November 2016].