

# Influenza Monthly Epidemiology Report, NSW

November 2017

This report describes the surveillance for influenza and other respiratory pathogens, undertaken by NSW Health to date. This includes data from a range of surveillance systems.

For weekly communicable disease surveillance updates refer to the Communicable Disease Weekly Reports at <http://www.health.nsw.gov.au/Infectious/reports/Pages/CDWR.aspx>.

## 1. Summary

- Influenza activity during November continued to decline and was generally low as is typical for this time of year. Both influenza A and B were circulating at similar levels.
- The rate of influenza like illness (ILI) presentations to selected emergency departments was low and consistent with inter-seasonal activity.
- The proportion of deaths attributed to pneumonia and influenza remained low.

## 2. Hospital Surveillance

NSW emergency department (ED) surveillance for influenza-like illness (ILI) and other respiratory illnesses is conducted through PHREDSS [1].

The PHREDSS surveillance system uses a statistic called the 'index of increase' to indicate when ILI presentations [2] are increasing at a statistically significant rate. It accumulates the difference between the previous day's count of presentations and the average for that weekday over the previous 12 months. An index of increase value of 15 is considered an important indicator for the start of the influenza season in NSW as it suggests influenza is circulating widely in the community.

In November 2017:

- Presentations in the *All respiratory illness, fever and unspecified infections* category decreased and were within the usual seasonal range, and likely represent presentations for respiratory conditions other than influenza, such as for asthma and bronchiolitis (Figure 1 and Table 1). Presentations were elevated at Kempsey Hospital.
- The index of increase for ILI presentations was 0.4 at the end November, well below the seasonal threshold of 15.
- ED presentations for ILI were within the historical range for this time of year overall (Figure 2).
- ED presentations for pneumonia [3] were within the historical range for this time of year (Figure 3).

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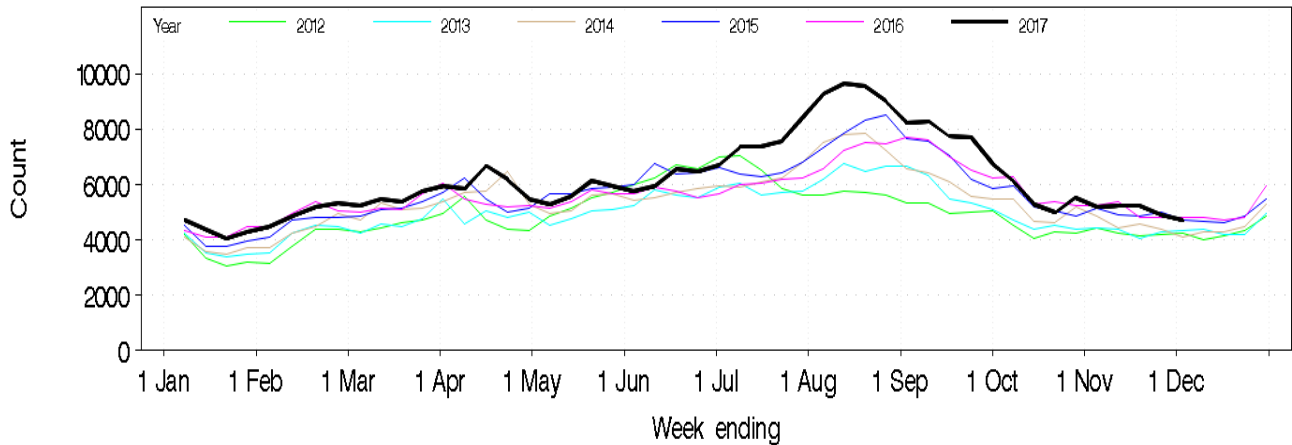
[1] NSW Health Public Health Rapid, Emergency Disease and Syndromic Surveillance system. Centre for Epidemiology and Evidence, NSW Ministry of Health. Comparisons are made with data for the preceding five years. Recent counts are subject to change. As of 31 March 2016, data from 60 NSW emergency departments (EDs), representing approximately 82% of ED visits in the 2015-16 financial year. The coverage of rural EDs is lower than the metropolitan EDs. Data shown represents unplanned presentations to hospital EDs.

[2] The ED 'ILI' syndrome includes provisional diagnosis selected by a clinician of 'influenza-like-illness' or 'influenza' (including 'pneumonia with influenza'), avian and other new influenza viruses.

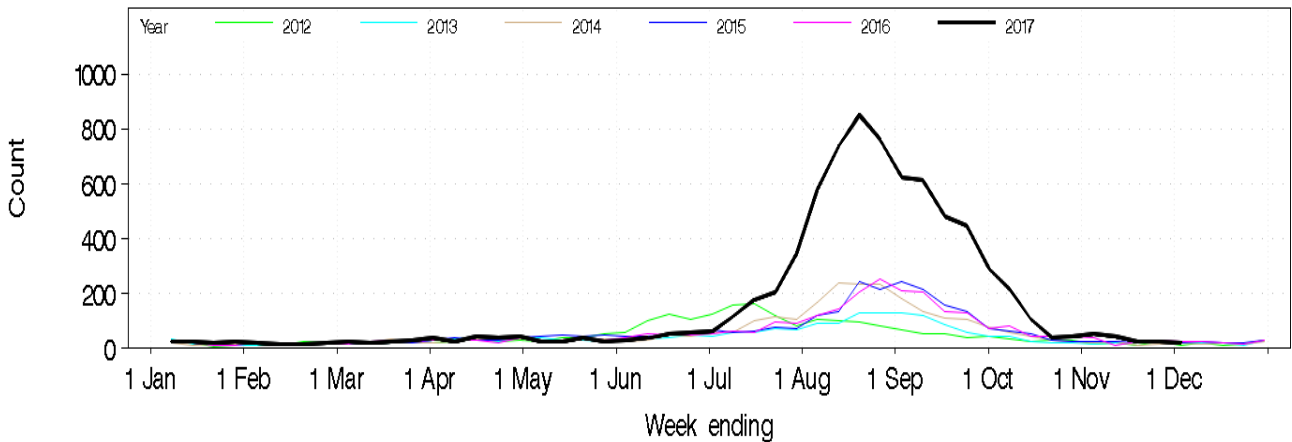
[3] The ED 'Pneumonia' syndrome includes provisional diagnoses selected by a clinician of 'viral, bacterial atypical or unspecified pneumonia', 'SARS', or 'legionnaire's disease'. It excludes the diagnosis 'pneumonia with influenza'.

- Pneumonia or ILI presentations which resulted in admissions to critical care units for ILI and pneumonia were within the historical range for this time of year (data not shown).
- Bronchiolitis presentations were steady and were within the usual range for this time of year, overall (Figure 4).

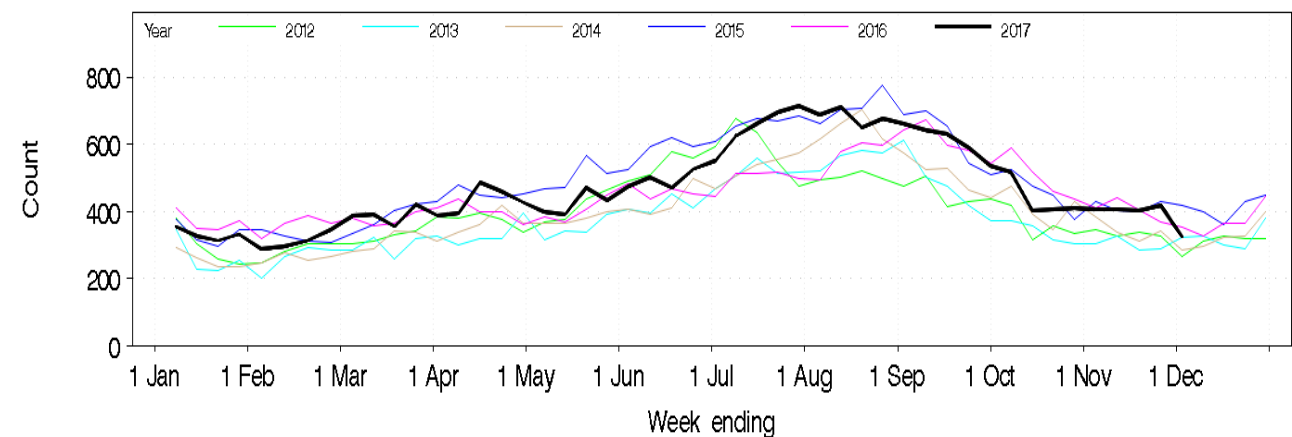
**Figure 1:** Total weekly counts of ED visits for any respiratory illness, fever and unspecified infections, all ages, November, 2017 (black line), compared with the 5 previous years (coloured lines).



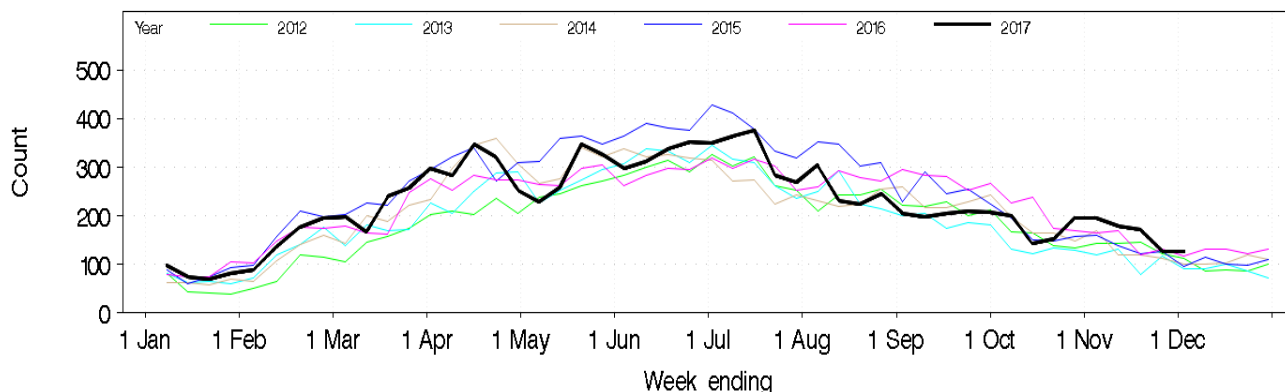
**Figure 2:** Total weekly counts of ED visits for influenza-like illness, all ages, November, 2017 (black line), compared with the 5 previous years (coloured lines).



**Figure 3:** Total weekly counts of Emergency Department visits for pneumonia, November 2017 (black line), compared with the 5 previous years (coloured lines).



**Figure 4:** Total weekly counts of Emergency Department visits for bronchiolitis, November 2017 (black line), compared with the 5 previous years (coloured lines).



### 3. Laboratory testing summary for influenza

Sentinel laboratory surveillance for influenza and other respiratory viruses is conducted throughout the year [4]. In November 2017:

- A total of 25,314 tests for respiratory viruses were performed at sentinel NSW laboratories and 626 (2.5%) were positive for influenza (Table 1).
- 319 specimens tested positive for influenza A – 25 of these tested positive for A(H3N2), 21 tested positive for influenza A(H1N1) and 273 were not typed further (Table 1, Figure 5 & 6).
- 307 cases of influenza B were reported (Table 1, Figure 5 & 6).

Influenza activity for November returned to inter-seasonal levels and activity was low. The rate was lower than this time last year but similar to previous years.

Rhinovirus was remained the leading respiratory viruses identified by laboratories. All other viruses are circulating at levels usually seen for this time of year.

[4]: Preliminary laboratory data is provided by participating sentinel laboratories on a weekly basis and are subject to change. Point-of-care test results have been included since August 2012 but serological diagnoses are not included. Preliminary laboratory data is provided by participating sentinel laboratories on a weekly basis and are subject to change. **Participating sentinel laboratories:** Pathology North (Hunter, Royal North Shore Hospital), Pathology West (Nepean, Westmead), South Eastern Area Laboratory Services, Sydney South West Pathology Service (Liverpool, Royal Prince Alfred Hospital), The Children’s Hospital at Westmead, Australian Clinical Labs, Douglas Hanly Moir Pathology, Laverty Pathology, Medlab, SydPath, VDRLab to June 2016.

**Table 1:** Summary of testing for influenza and other respiratory viruses at sentinel NSW laboratories, 2 January to 3 December 2017.

Month ending	Total Tests	TEST RESULTS																	
		Influenza A								Influenza B		Adeno	Parainf 1, 2 & 3	RSV	Rhino	HMPV **	Entero		
		Total		H3N2		H1N1 pdm09		A (Not typed)		Total									
		Total	(%)	Total	(%A)	Total	(%A)	Total	(%A)	Total	(%)								
29/01/2017	10112	497	(4.9%)	53	(10.7%)	4	(0.8%)	440	(88.5%)	93	(0.9%)	375	433	323	1462	236	131		
26/02/2017	12273	564	(4.6%)	78	(13.8%)	7	(1.2%)	479	(84.9%)	83	(0.7%)	430	458	719	2772	170	248		
02/04/2017*	21262	725	(3.4%)	83	(11.4%)	16	(2.2%)	626	(86.3%)	158	(0.7%)	684	1000	1830	5427	290	530		
30/04/2017	18089	373	(2.1%)	63	(16.9%)	15	(4.0%)	295	(79.1%)	135	(0.7%)	588	901	2600	4202	231	468		
04/06/2017*	26372	657	(2.5%)	67	(10.2%)	52	(7.9%)	538	(81.9%)	506	(1.9%)	1037	852	3275	6859	299	503		
02/07/2017	25688	1407	(5.5%)	104	(7.4%)	73	(5.2%)	1230	(87.4%)	1530	(6.0%)	1058	734	3291	5794	441	490		
30/07/2017	46579	9328	(20.0%)	748	(8.0%)	250	(2.7%)	8330	(89.3%)	4516	(9.7%)	1712	926	4059	6011	709	625		
03/09/2017*	108262	31677	(29.3%)	1869	(5.9%)	529	(1.7%)	29474	(93.0%)	19670	(18.2%)	2984	1180	4099	8255	1141	681		
01/10/2017	70006	11926	(17.0%)	591	(5.0%)	237	(2.0%)	10558	(88.5%)	12827	(18.3%)	1597	1193	1499	5448	926	305		
29/10/2017	31674	1444	(4.6%)	102	(7.1%)	51	(3.5%)	1291	(89.4%)	2459	(7.8%)	1003	1187	684	3873	748	242		
03/12/2017*	25314	319	(1.3%)	25	(7.8%)	21	(6.6%)	273	(85.6%)	307	(1.2%)	926	1104	526	5649	612	439		
Week ending	Total Tests	Influenza A										Influenza B		Adeno	Parainf 1, 2 & 3	RSV	Rhino	HMPV **	Entero
Total	(%)	Total	(%A)	Total	(%A)	Total	(%A)	Total	(%)										
05/11/2017	5982	69	(1.2%)	6	(8.7%)	2	(2.9%)	61	(88.4%)	105	(1.8%)	204	271	138	1362	133	102		
12/11/2017	5632	90	(1.6%)	7	(7.8%)	7	(7.8%)	76	(84.4%)	67	(1.2%)	207	255	130	1285	149	89		
19/11/2017	5261	60	(1.1%)	7	(11.7%)	3	(5.0%)	50	(83.3%)	57	(1.1%)	174	222	96	1226	136	64		
26/11/2017	4453	48	(1.1%)	5	(10.4%)	5	(10.4%)	38	(79.2%)	45	(1.0%)	172	192	78	971	102	83		
03/12/2017	3986	52	(1.3%)	0	(0.0%)	4	(7.7%)	48	(92.3%)	33	(0.8%)	169	164	84	805	92	101		

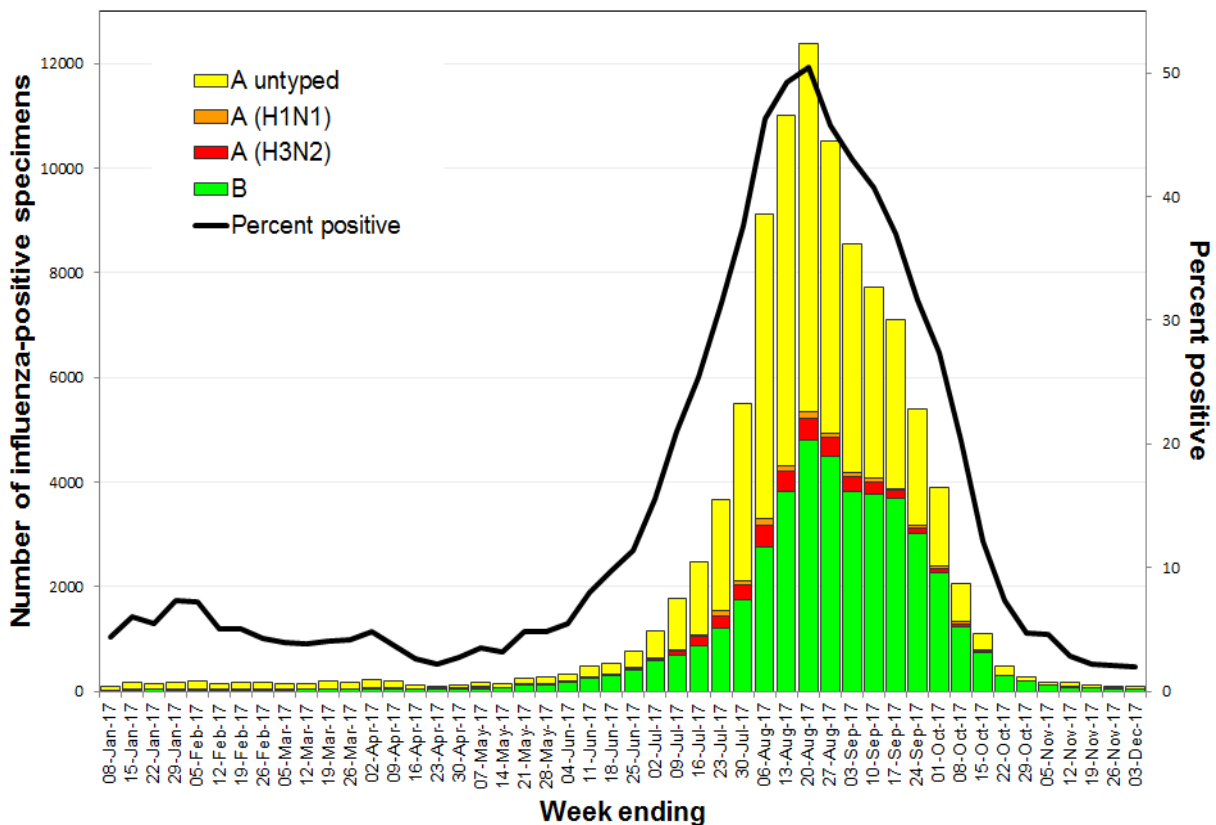
**Notes:**

\* 5 week period

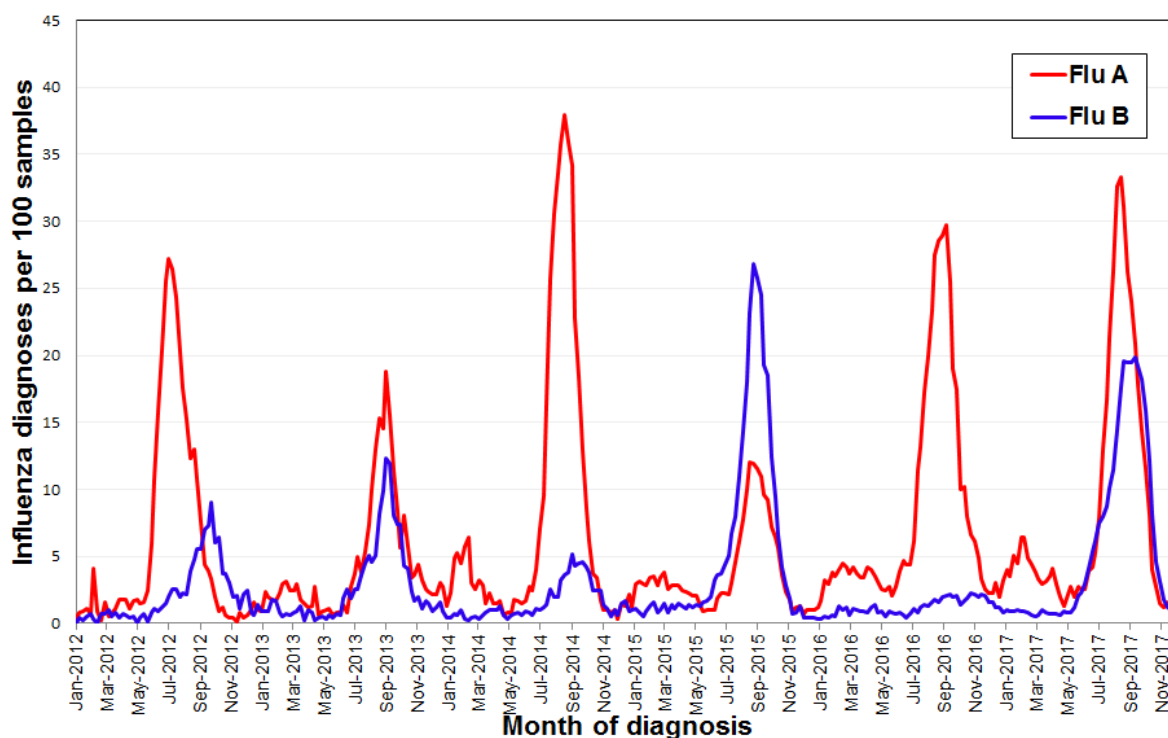
\*\* HMPV - Human metapneumovirus.

All samples are tested for influenza viruses but not all samples are tested for all of the other viruses listed.

**Figure 5:** Weekly influenza positive test results by type and sub-type reported by NSW sentinel laboratories, 2 January to 3 December 2017.



**Figure 6:** Percent of laboratory tests positive for influenza A and influenza B reported by NSW sentinel laboratories, 2 January 2012 to 3 December 2017.



## 4. Community Surveillance

### Influenza notifications by Local Health District (LHD)

During November there were 184 notifications of influenza confirmed by polymerase chain reaction (PCR) testing, lower than the 1,112 influenza notifications reported for November 2016 and below the notifications reported for the previous month October 2017 (438).

Rates were low and similar across all LHDs. In the final week of the month rates were highest in Northern NSW and South Eastern Sydney LHDs (Table 2).

**Table 2:** Weekly notifications of laboratory-confirmed influenza by Local Health District.

Local Health District	Week ending 03 Dec 2017		Average (previous 4 weeks)	
	Number of notifications	Rate per 100 000 population	Number of notifications	Rate per 100 000 population
Central Coast	2	0.58	8	2.17
Far West	1	3.27	2	4.9
Hunter New England	18	1.94	27	2.93
Illawarra Shoalhaven	10	2.45	7	1.59
Mid North Coast	1	0.45	3	1.12
Murrumbidgee	3	1.24	9	3.72
Nepean Blue Mountains	5	1.3	9	2.43
Northern NSW	16	5.22	13	4.08
Northern Sydney	20	2.19	26	2.84
South Eastern Sydney	38	4.1	21	2.29
South Western Sydney	29	2.93	17	1.72
Southern NSW	0	0	2	0.93
Sydney	18	2.75	16	2.41
Western NSW	0	0	4	1.34
Western Sydney	23	2.37	27	2.78

**Note:**

\* All data are preliminary and may change as more notifications are received. Excludes notifications based on serology.

**Influenza outbreaks in institutions**

There were four respiratory outbreaks reported this month, two in residential care facilities and two in hospitals. Three were caused by influenza (influenza A not further typed) and one was influenza B (Table 3).

In the year to date there have been 588 laboratory confirmed influenza outbreaks in institutions reported to NSW public health units (Table 4): 422 have been due to influenza A, 114 were due to influenza B, 52 involved both influenza A and B strains, and the strain for one is pending.

In outbreaks affecting aged care facilities, at least 7123 residents were reported to have had ILI symptoms and 692 required hospitalisation. Overall, there have been 301 deaths in residents reported linked to these outbreaks, all of whom were noted to have other significant co-morbidities.

People in older age-groups are at higher risk of infection from the influenza A(H3N2) strain than the influenza A(H1N1) strain. The influenza A(H3N2) strain also predominated in 2012, 2014 and 2016. In 2015, influenza B was the predominant strain, and was also associated with an increase in influenza outbreaks in institutions, particularly residential aged care facilities (Table 4).

**Table 3:** Reported influenza outbreaks in NSW institutions, January 2010 to November 2017.

Year	2010	2011	2012	2013	2014	2015	2016	2017*
No. of outbreaks	2	4	39	12	120	103	279	588

**Notes:**

\* Year to date.

## 5. Deaths with pneumonia or influenza reported on the death certificate

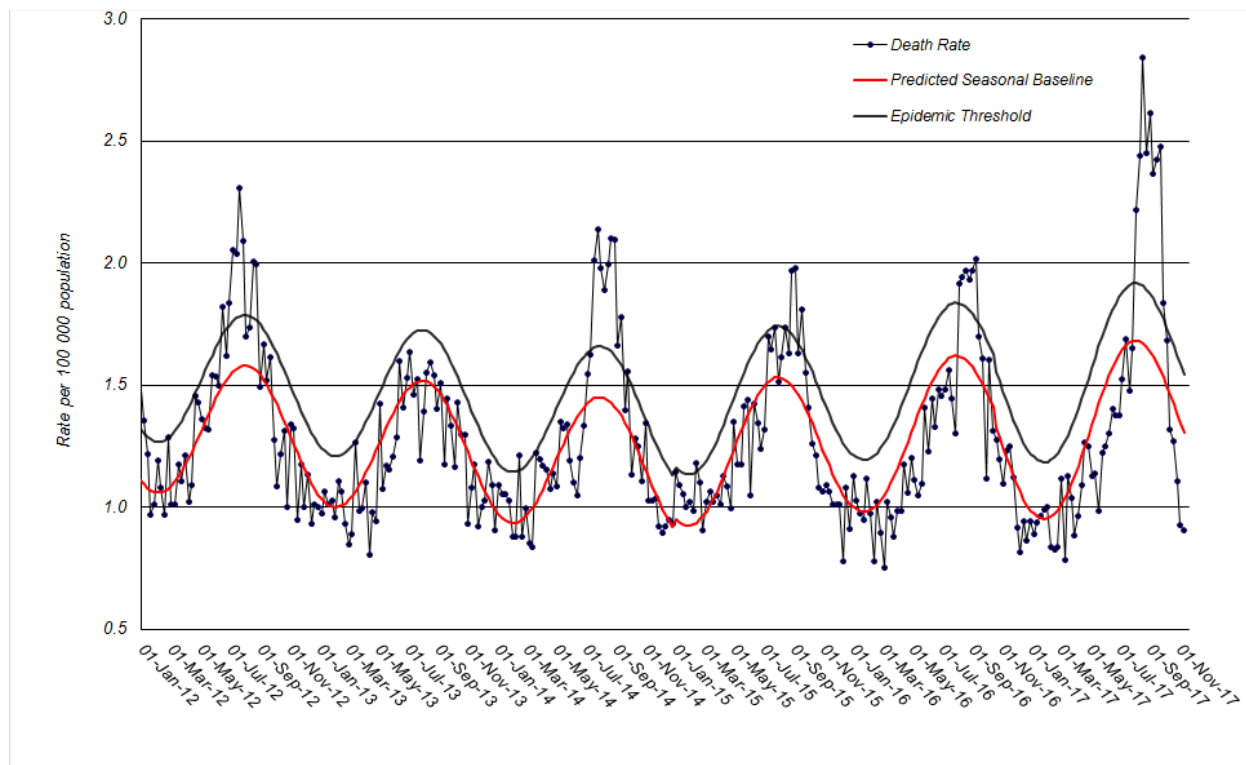
Deaths registration data is routinely reviewed for deaths attributed to pneumonia or influenza. While pneumonia has many causes, a well-known indicator of seasonal and pandemic influenza activity is an increase in the number of death certificates that mention pneumonia or influenza as a cause of death.

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.

**Up to the week ending 10 November 2017:**

- In 2017 45 of the 47,544 death certificates mentioned influenza; two deaths were in children under 15 years, three deaths were in people aged 15 to 24 years, three deaths in people aged 35 to 44 years, four deaths in people aged 45 to 54 years, the remainder of deaths have been in people aged over 55 years.
- A total of 4,606 of the 47,544 death certificates mentioned pneumonia.
- There were 0.90 influenza and pneumonia deaths per 100 000 NSW population, which was below the epidemic threshold of 1.54 per 100 000 population (Figure 8).

**Figure 8:** Rate of deaths classified as influenza and pneumonia per 100 000 NSW population, 2012 - 2017.



Source: NSW Registry of Births, Deaths and Marriages.

**\* Notes on interpreting death data:**

- 1) The number of deaths mentioning “Pneumonia or influenza” is reported as a rate per 100,000 NSW population. Using the NSW population provides a more stable and reliable denominator than deaths from all causes. This is because pneumonia and influenza are known to contribute to increases in deaths from non-respiratory illnesses, such as deaths due to ischaemic heart disease. As the number of these deaths will increase with rises in influenza activity, the actual effect of influenza on mortality rates will be obscured if all-cause mortality is used as the denominator. This limitation is avoided by using the NSW population, which is relatively constant throughout the year, as the denominator.
- 2) Deaths referred to a coroner during the reporting period may not be available for analysis. Deaths in younger people may be more likely to require a coronial inquest. Therefore influenza-related deaths in younger people may be under-represented in these data.
- 3) The interval between death and death data availability is usually at least 7 days, and so these data are one week behind reports from emergency departments and laboratories. In addition, previous weekly rates may also change due to longer delays in reporting some deaths.

## 6. National and International Influenza Surveillance

### National Influenza Surveillance

The most recent available information is in the *Australian Surveillance Report No. 12*, with data up to 27 October 2017. Nationally, influenza activity declined this reporting fortnight after reaching a peak in mid-August. Surveillance systems indicate that national activity levels have returned to or are approaching baseline levels. Of note:

- The peak week of national influenza activity this season has been at comparable or higher levels than in recent years, with high activity persisting at the peak of the season for a number of weeks.
- 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 when compared with the same period last year. An earlier season onset and introduction of rapid

testing have contributed, in part, to this increase. Administrative backlogs in data entry experienced in some jurisdictions are likely to alter the pattern of notifications once the backlog is resolved.

- National indicators of influenza-like illness (ILI) continued to decline in the reporting fortnight and are within historical ranges for this time of year. The most commonly detected respiratory virus in patients presenting to sentinel general practitioners with ILI this reporting fortnight was rhinovirus.
- While influenza A(H3N2) was the dominant circulating influenza virus throughout the season, influenza B is currently the dominant circulating influenza virus nationally and in many jurisdictions.
- Notification rates this year to date have been highest in adults aged 80 years and older, with a secondary peak in young children, aged 5 to 9 years. This is consistent with previous seasons where influenza A(H3N2) and influenza B, respectively, have dominated.
- Admissions to sentinel hospitals with confirmed influenza decreased this reporting fortnight, following a peak in late August. The large number of admissions this season is consistent with the higher number of cases in the community, and not necessarily reflecting an increase in severity of infection.
- The severity of infection in people hospitalised with influenza was on the low end of the 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 and the predominance of influenza A(H3N2) throughout the season. Most of the reported deaths have been in the elderly.
- The effectiveness of the 2017 seasonal influenza vaccine has been preliminarily estimated to be low.

For further information see the [Australian Influenza Surveillance Reports](#).

### **Global Influenza Update**

The latest [WHO global update on 27 November 2017](#) provides data up to 12 November. Influenza activity increased slightly in the temperate zone of the northern hemisphere while in the temperate zone of the southern hemisphere activity appeared to have decreased at inter-seasonal levels. In Central America and the Caribbean, influenza activity remained low. Worldwide, influenza A(H3N2) and B viruses accounted for the majority of influenza detections. Follow the link for the [WHO influenza surveillance reports](#).

### **Influenza at the human-animal interface**

WHO publishes regular updated risk assessments of human infections with avian and other non-seasonal influenza viruses at [Influenza at the human-animal interface](#), with the most recent report published on 27 September 2017. These reports provide information on human cases of infection with non-seasonal influenza viruses, such as H5 and H7 clade viruses, and outbreaks among animals.

Since the last update on 25 July 2017, one new laboratory-confirmed human case of influenza A(H5N1) virus infection was reported to WHO from Indonesia, the first case report from Indonesia since 2015. The patient was a child who passed away on 10 September. Prior to illness onset, he reportedly had exposure to poultry at his house.

The overall risk assessment for these viruses remains unchanged. Whenever avian influenza viruses are circulating in poultry, sporadic infections and small clusters of human cases are possible in people exposed to infected poultry or contaminated environments, therefore sporadic human cases would not be unexpected.



Other sources of information on avian influenza and the risk of human infection include:

- US CDC [Avian influenza](#)
- European CDC (ECDC) [Avian influenza](#)
- Public Health Agency of Canada [Avian influenza H7N9](#).

## 7. Composition of 2018 Australian influenza vaccines

The WHO Consultation on the Composition of Influenza Vaccines for the 2018 Southern Hemisphere was held in Melbourne on 25-27 September 2017.

The consultation report noted that during the period February – September 2017, influenza A(H3N2) viruses were associated with outbreaks in many countries. The majority of recent viruses were antigenically related to 3C.2a clade A/Hong Kong/4801/2014-like viruses but reacted poorly with ferret antisera raised to the egg-propagated A/Hong Kong/4801/2014-like viruses used in current seasonal vaccines. Influenza A(H3N2) viruses within the 3C.2a clade and 3C.2a1 subclade have become genetically diverse.

Recent A(H3N2) viruses were better inhibited by a ferret antiserum raised against the egg-propagated reference virus, A/Singapore/INFIMH-16-0019/2016, compared to ferret antisera raised against other egg-propagated A(H3N2) viruses.

Influenza A(H1N1) and influenza B/Victoria lineage strains identified in the same period were antigenically and genetically closely related to the corresponding strains in the current vaccines.

Following the Consultation, WHO announced its recommendations for the composition of quadrivalent vaccines for use in the 2018 Southern Hemisphere influenza season, which includes changes in the influenza A(H3N2) components, as follows:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus
- an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus<sup>5</sup>
- a B/Phuket/3073/2013-like virus (Yamagata lineage)
- a B/Brisbane/60/2008-like virus (Victoria lineage).<sup>6</sup>

More details about the most recent influenza vaccine recommendations can be found at: <http://www.who.int/influenza/vaccines/virus/en/>.

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<sup>5</sup> This replaces A/Hong Kong/4801/2014 (H3N2)-like virus used in the current 2017 seasonal influenza vaccines.

<sup>6</sup> This B/Brisbane strain had been part of the WHO recommendations for 2017 southern hemisphere trivalent influenza vaccines but has been replaced by the B/Phuket strain for 2018 trivalent vaccines. All vaccines used in Australia in 2017 were quadrivalent and so contained both B vaccine strains.