Influenza Monthly Epidemiology Report, NSW

November 2016

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 Report at http://www.health.nsw.gov.au/publichealth/infectious/index.asp.

1. Summary

- Influenza A and B strains are continuing to circulate at low inter-seasonal levels.
- Influenza activity is likely to remain at low levels until the winter of 2017.

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 a considered an important signal for the start of the influenza season in NSW as it suggests influenza is circulating widely in the community.

In November 2016:

- ED presentations for ILI were within the historical average for this time of year (Figure 1).
- ED presentations for pneumonia [3] were above the historical average (Figure 2).
- Pneumonia or ILI presentations which resulted in admissions to critical care units for ILI and pneumonia were within the usual range for this time of year (Figure 3).
- Bronchiolitis presentations were within the usual range for this time of year.
- The category combining all respiratory, fever and unspecified infection presentations were steady and were within the usual range for this time of year (data not shown).

[1]NSW Health Public Health Rapid, Emergency Disease and Syndromic Surveillance (PHREDSS) 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. Data from 60 NSW emergency departments (EDs) are included representing approximately 82% of ED visits in the 2014-15 financial year. The coverage of rural EDs is lower than metropolitan EDs.
[2]The ED 'ILI' syndrome includes provisional diagnoses selected by a clinician of 'influenza-like illness' or 'influenza' (including 'pneumonia with influenza'), avian and other new influenza viruses.
[3] Pneumonia is when there is a provisional clinical diagnosis of Pneumonia Syndrome, which includes: 'viral, bacterial or unspecified pneumonia', 'SARS', or 'legionnaire's disease'. Excludes the diagnosis 'pneumonia with influenza'.

Figure 1: Total weekly counts of ED visits for influenza-like illness, from January to November 2016 (black line), compared with each of the 5 previous years (coloured lines), for 60 NSW hospitals.

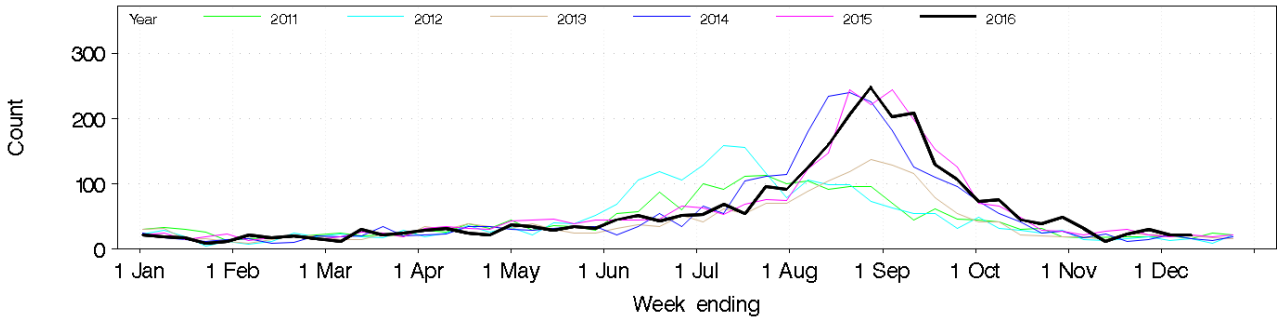


Figure 2: Total weekly counts of ED presentations for pneumonia, from January to November 2016 (black line), compared with each of the 5 previous years (coloured lines), for 60 NSW hospitals.

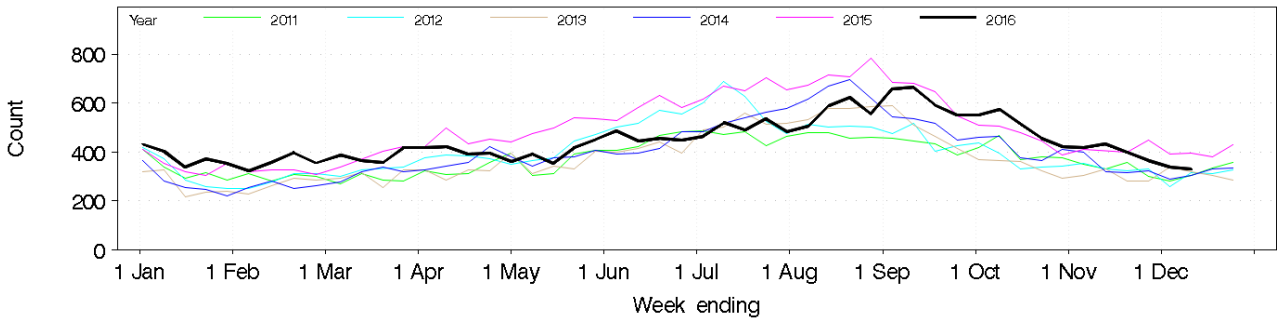
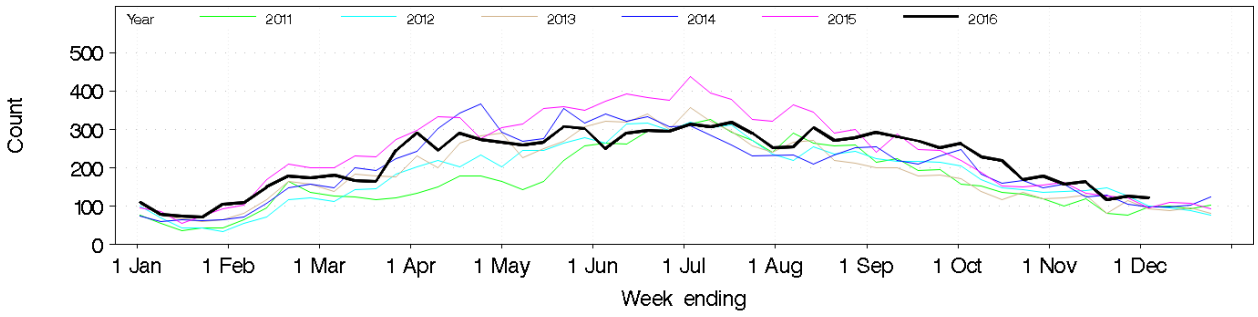


Figure 3: Total weekly counts of Emergency Department visits for bronchiolitis, from January – November 2016 (black line), compared with the 5 previous years (coloured lines) for 60 NSW Hospitals.



3. Laboratory testing summary for influenza

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

[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. **Participating sentinel laboratories:** Pathology North (Royal North Shore Hospital, Hunter, Lismore, Coffs Harbour laboratories); Pathology West (Westmead, Nepean laboratories); South Eastern Area Laboratory Services; Sydney South West Pathology Service (Liverpool, Royal Prince Alfred Hospital laboratories), The Children's Hospital at Westmead; Douglas Hanly Moir Pathology; Laverty Pathology; Medlab; SydPath (St Vincent's Hospital), VDRLab.

In November 2016:

- A total of 20,536 tests for respiratory viruses were performed at sentinel NSW laboratories and 1,039 (5.1%) were positive for influenza (Table 1).
- 656 specimens tested positive for influenza A – 88 tested positive for influenza A(H3N2),11 of these tested positive for A(H1N1) and 555 were not typed further (Table 1, Figure 4 & 5).
- 383 cases of influenza B were reported (Table 1, Figure 4 & 5).

The number of influenza-positive tests has declined throughout November. However, overall influenza activity remains slightly higher than usual for this time of year. Rhinoviruses were the leading respiratory viruses identified by laboratories. Other viruses are circulating at usual levels for this time of year.

Table 1: Summary of testing for influenza and other respiratory viruses at sentinel NSW laboratories, 1 January to 4 December 2016.

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	(%)						
31/01/2016	8079	270	(3.3%)	45	(16.7%)	114	(42.2%)	111	(41.1%)	38	(0.5%)	202	179	202	941	73	96
28/02/2016	9810	397	(4.0%)	54	(13.6%)	199	(50.1%)	144	(36.3%)	96	(1.0%)	208	244	323	1484	80	150
03/04/2016*	14699	555	(3.8%)	32	(5.8%)	271	(48.8%)	248	(44.7%)	138	(0.9%)	282	412	937	1862	68	188
01/05/2016	13614	457	(3.4%)	16	(3.5%)	268	(58.6%)	173	(37.9%)	152	(1.1%)	271	371	1189	1470	71	128
29/05/2016	15760	398	(2.5%)	57	(14.3%)	157	(39.4%)	184	(46.2%)	115	(0.7%)	350	358	1488	2211	111	138
03/07/2016*	22487	1065	(4.7%)	227	(21.3%)	269	(25.3%)	569	(53.4%)	167	(0.7%)	707	636	2626	2866	300	420
31/07/2016	24176	3796	(15.7%)	1021	(26.9%)	722	(19.0%)	2052	(54.1%)	291	(1.2%)	753	527	2339	2240	484	404
28/08/2016	40031	10953	(27.4%)	1852	(16.9%)	1002	(9.1%)	7999	(73.0%)	705	(1.8%)	1114	721	2347	2739	1046	398
02/10/2016*	54948	11742	(21.4%)	575	(4.9%)	355	(3.0%)	10814	(92.1%)	1128	(2.1%)	1826	1587	2197	5022	2527	584
30/10/2016	23910	1867	(7.8%)	168	(9.0%)	23	(1.2%)	1676	(89.8%)	466	(1.9%)	973	1113	705	3946	1267	302
04/12/2016*	20536	656	(3.2%)	88	(13.4%)	11	(1.7%)	555	(84.6%)	383	(1.9%)	886	1006	398	4389	735	340
Week ending																	
06/11/2016	4806	236	(4.9%)	17	(7.2%)	4	(1.7%)	215	(91.1%)	96	(2.0%)	178	230	105	1072	206	71
13/11/2016	4515	149	(3.3%)	21	(14.1%)	1	(0.7%)	125	(83.9%)	100	(2.2%)	179	212	85	1026	166	60
20/11/2016	3969	102	(2.6%)	20	(19.6%)	1	(1.0%)	81	(79.4%)	85	(2.1%)	169	192	67	827	143	65
27/11/2016	3792	88	(2.3%)	9	(10.2%)	3	(3.4%)	76	(86.4%)	62	(1.6%)	190	204	77	747	120	72
04/12/2016	3454	81	(2.3%)	21	(25.9%)	2	(2.5%)	58	(71.6%)	40	(1.2%)	170	168	64	717	100	72

Notes: * Five 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.

There is no data for Pathology North - Hunter Laboratory for week ending 3/4/2016.

Figure 4: Weekly influenza positive test results by type and sub-type reported by NSW sentinel laboratories, 1 January to 4 December 2016.

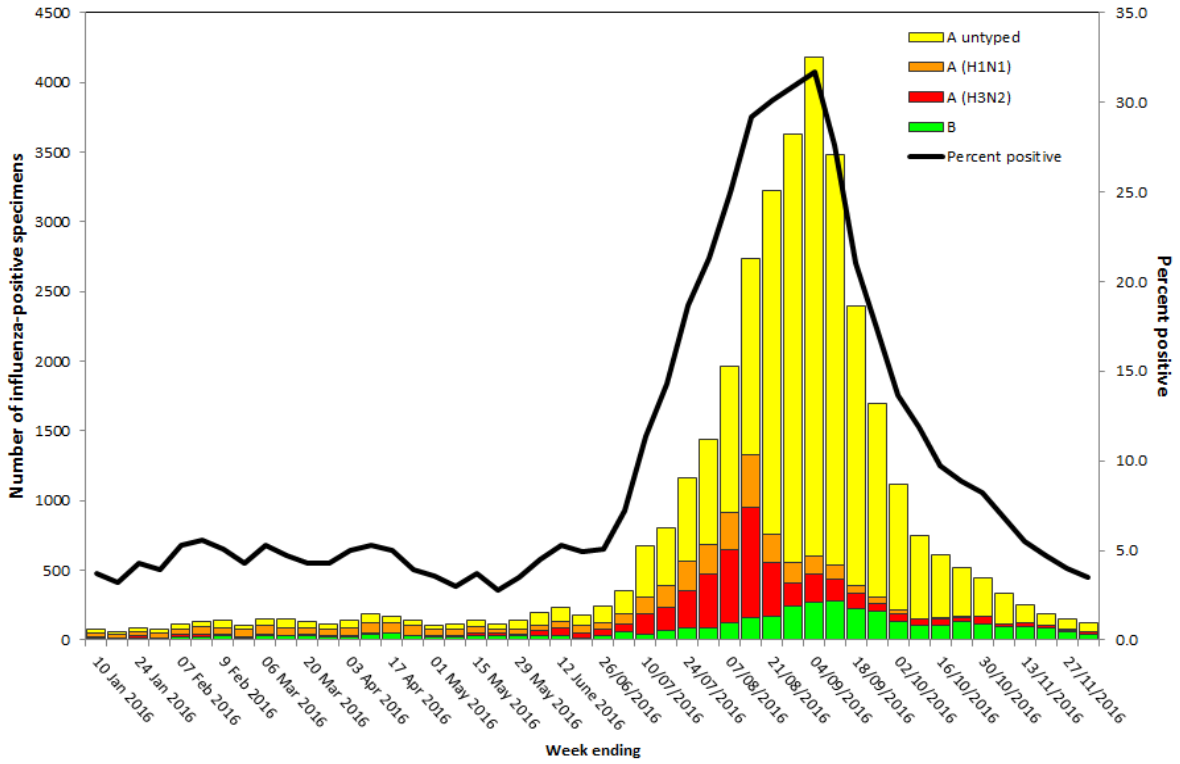
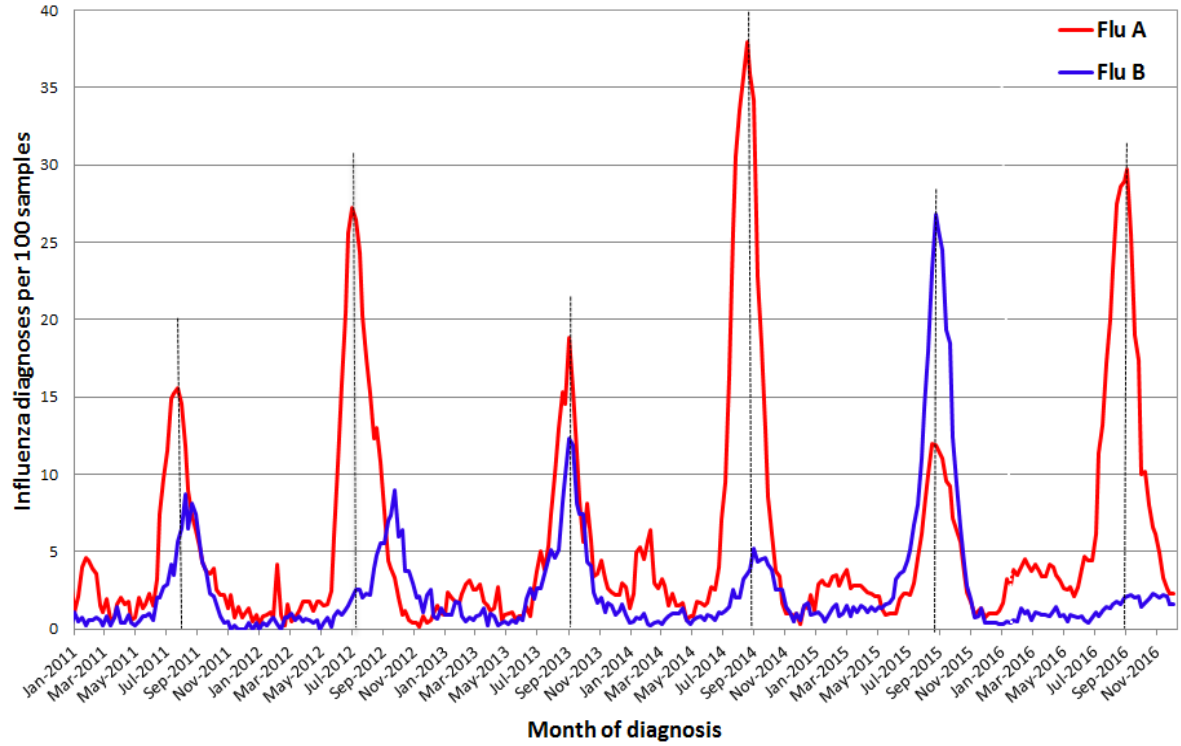


Figure 5: Percent of laboratory tests positive for influenza A and influenza B reported by NSW sentinel laboratories, 1 January 2010 to 4 December 2016.



4. Community Surveillance

Influenza notifications by Local Health District (LHD)

During November (5 week period) there were 1,112 notifications of influenza confirmed by polymerase chain reaction (PCR) testing, lower than the 2,087 influenza notifications reported for October 2016. Population rates were low and similar across all LHDs (Table 2).

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

Local Health District	Week ending 04 Dec 2016		Weekly average (previous 4 weeks)	
	Number of notifications	Rate per 100 000 population	Number of notifications	Rate per 100 000 population
Central Coast	4	1.18	5	1.58
Far West	0	0	1	3.28
Hunter New England	14	1.53	29	3.14
Illawarra Shoalhaven	12	2.98	9	2.23
Mid North Coast	1	0.46	2	0.77
Murrumbidgee	3	1.26	8	3.45
Nepean Blue Mountains	7	1.87	14	3.8
Northern NSW	3	1	8	2.75
Northern Sydney	16	1.76	35	3.86
South Eastern Sydney	18	1.99	34	3.79
South Western Sydney	15	1.55	24	2.46
Southern NSW	2	0.96	3	1.2
Sydney	8	1.27	23	3.66
Western NSW	2	0.72	11	3.79
Western Sydney	19	2.01	44	4.59

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

Influenza outbreaks in institutions

There were three influenza A outbreaks reported this month in aged care facilities. All were due to influenza A (Table 3).

In the year to date there have been 275 laboratory confirmed influenza outbreaks in institutions reported to NSW public health units (Table 4): 268 have been due to influenza A, five were influenza B, and three were combined influenza A and B outbreaks. At least 4,060 residents were reported to have had ILI symptoms and 468 required hospitalisation. One hundred and ninety onedeaths in residents linked to these outbreaks have been reported, all of whom were noted to have other significant co-morbidities.

People in older age-groups are at higher risk of infection from influenza A(H3N2) strains than from the influenza A(H1N1) strain. The influenza A(H3N2) strain predominated in 2012 and 2014. In 2015, influenza B was the predominant strain, and was also the cause of some influenza outbreaks in institutions, particularly residential aged care facilities (Table 3).

Table 3: Reported influenza outbreaks in NSW institutions, January 2010 to November 2016.

Year	2010	2011	2012	2013	2014	2015	2016*
No. of outbreaks	2	4	39	12	120	103	275

Notes: * Year to date.

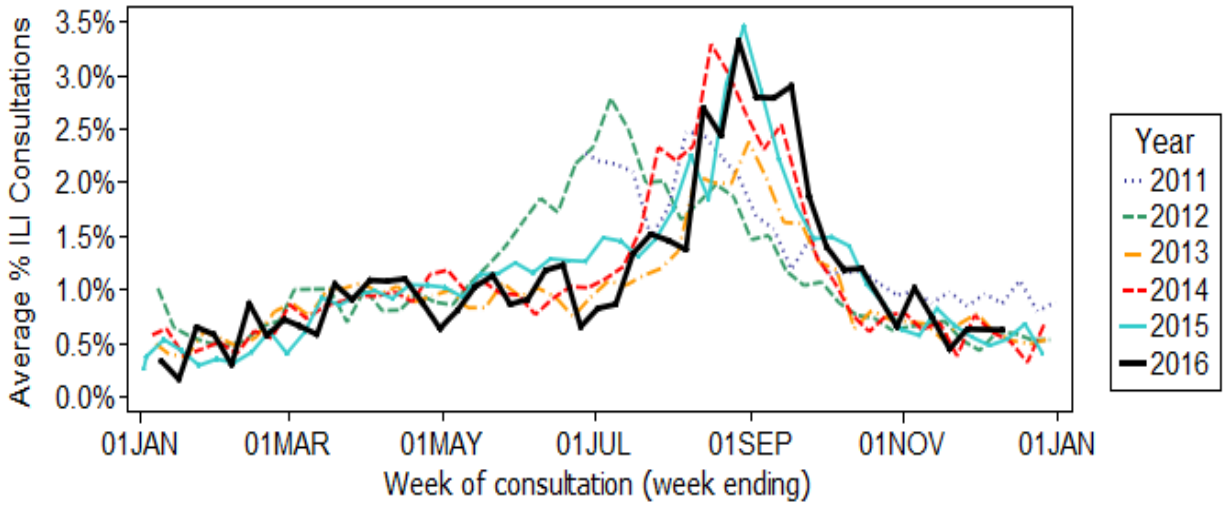
Electronic General Practice Surveillance (eGPS)

eGPS is a primary care influenza surveillance system involving sentinel general practices within three NSW Local Health Districts (LHD): Northern Sydney (NS), South Eastern Sydney (SES) and Illawarra Shoalhaven (IS). The system monitors patient consultations for influenza-like illness (ILI) as an indicator of influenza activity. Consultations for ILI are identified each week by an automatic search of electronic records for validated combinations of ILI terms rather than diagnosis codes.

In November 2016:

- Weekly reports were received on average from 5 sentinel practices (all Northern Sydney practices).
- The average rate for patient consultations with ILI was 0.7% (range 0.3 – 1.3), within the historical average (Figure 6).

Figure 6. ILI consultations as a percentage of all consultations at sentinel general practices, by week of consultation, 2012 to November 2016.



Notes on eGPS data:

- The number of practices reporting may vary from week to week. Data is available from Week 29, 2011.
- Data generated from eGPS should be interpreted with caution as it is not representative of all practices within the participating LHDs or across NSW.

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.

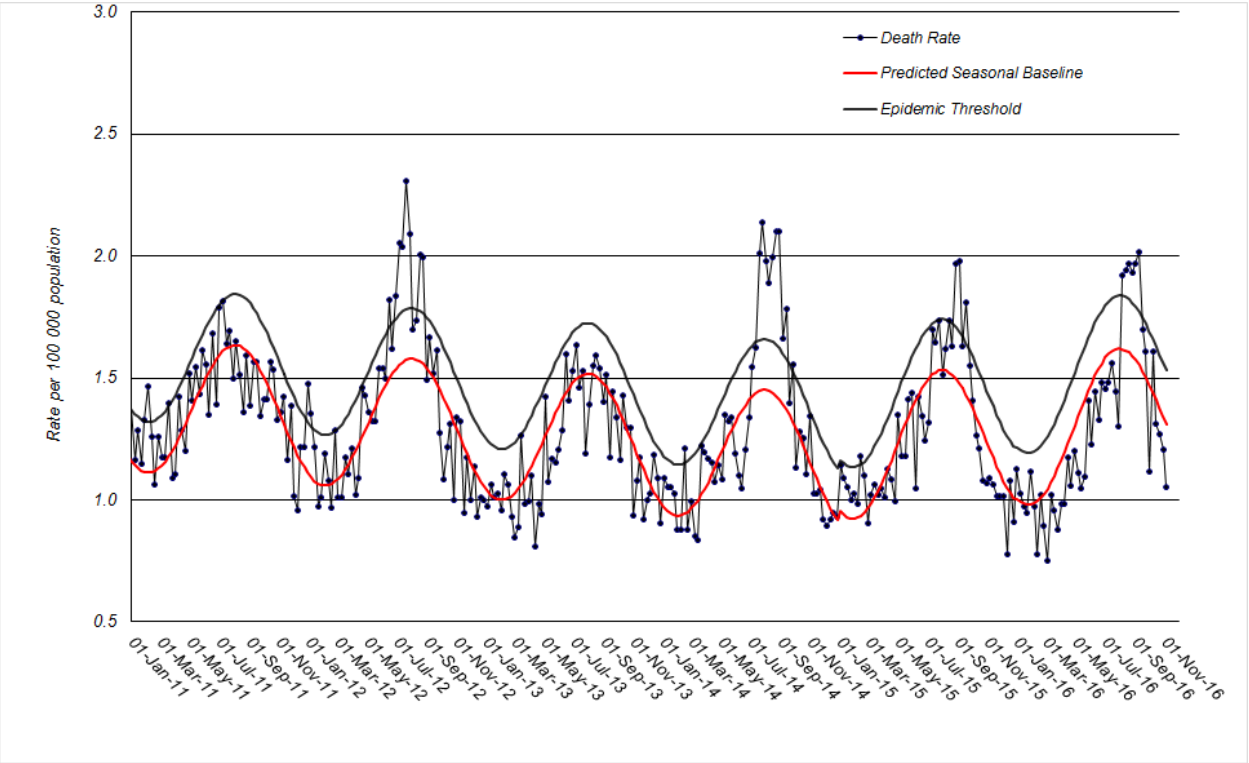
The predicted seasonal baseline estimates the predicted rate of influenza or pneumonia deaths in the absence of influenza epidemics. If deaths exceed the epidemic threshold, then it may be an indication that influenza is beginning to circulate widely.

For 2016 up to 18 November there have been 46 635 death certificates registered. Of note:

- 208 death certificates have mentioned influenza: one death was in a person aged 15 to 24 years, two deaths in persons aged 25 to 54 years, six deaths in persons aged 55 to 64 years, and 197 deaths were in persons aged 65 years and over

- 4476 death certificates mentioned pneumonia
- In the week to 18 November there were 1.21 influenza and pneumonia deaths per 100 000 NSW population, which was below the epidemic threshold of 1.47 per 100 000 population (Figure 7).

Figure 7: Rate of deaths classified as influenza and pneumonia per 100 000 NSW population, 2011 - 2016.



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

Although national influenza surveillance reports are not produced at this time of year, all jurisdictions are reporting decreased influenza activity. Total national reports of laboratory-confirmed influenza in November were moderate, and higher than in earlier years.

For further information on the National Notifiable Disease Surveillance System, which includes laboratory-confirmed influenza reports, see: http://www9.health.gov.au/cda/source/cda-index.cfm.

Global Influenza Update

The latest WHO global update on 12 December 2016 provides data up to 27 November. Influenza activity in the temperate zone of the northern hemisphere increased slightly. In North America, influenza activity slightly increased with influenza A(H3N2) virus predominating. Influenza-like illness (ILI) levels remained below seasonal thresholds. In the United States, respiratory syncytial virus (RSV) activity continued to be reported. In Europe, influenza activity was low but has started to rise, particularly in Northern European countries. Influenza A viruses were predominating with the most frequent subtype being A(H3N2). The season has started earlier than usual with a positivity rate ≥10% for influenza among sentinel surveillance samples. In East Asia, influenza activity increased slightly with influenza A(H3N2) remaining the dominant virus circulating. Follow the link for the WHO influenza surveillance reports.

Avian Influenza Update:

Human infections with avian influenza viruses

The monthly WHO risk assessment of human infections with avian and swine influenza viruses (see Influenza at the human-animal interface) was published on 21 November 2016. This report provides updated information on human cases of infection with animal influenza viruses and outbreaks among animals caused by novel influenza strains.

Of note:

- Since the previous update, new human infections with A(H5N6), A(H7N9), and A(H1N1)v viruses were reported.
- The overall public health risk from currently known influenza viruses at the human-animal interface has not changed. Further human infections with viruses of animal origin can be expected, but the likelihood of sustained human-to-human transmission remains low.

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 2017 Australian influenza vaccines

The WHO Consultation on the Composition of Influenza Vaccines for the 2017 Southern Hemisphere was held in Geneva on 26-28 September 2016.

Following the Consultation, WHO announced its recommendations for the composition of trivalent vaccine for use in the 2017 Southern Hemisphere influenza season as follows:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;
- an A/Hong Kong/4801/2014 (H3N2)-like virus;
- a B/Brisbane/60/2008-like virus (Victoria lineage)

WHO also recommended that quadrivalent vaccines containing two influenza B viruses should contain the above three viruses and a B/Phuket/3073/2013-like virus.

Of note, there has been replacement of the A/California/7/2009 (H1N1)pdm09-like virus component with an A/Michigan/45/2015 (H1N1)pdm09-like virus in the vaccine recommendations, the first time the recommended A(H1N1) strain has changed since 2010.

More details about the most recent influenza vaccine recommendations can be found at: http://www.who.int/influenza/vaccines/virus/recommendations/2017_south/en/.

The WHO consultation on the composition of influenza vaccines for the Northern Hemisphere 2016-2017 influenza season was held in February 2016. The recommended composition was unchanged from the composition recommended for the 2016 Southern Hemisphere vaccines. Information about the Northern Hemisphere vaccine recommendations can be found at: http://www.who.int/influenza/vaccines/virus/recommendations/2016_17_north/en/