NSW Health Influenza Surveillance Report

Week 40: 3 to 9 October 2016

Summary:

- **Seasonal influenza activity continues to fall across most NSW local health districts, with some indicators indicating an end to the 2016 influenza season.**
- **Influenza A(H3N2) remains the dominant circulating influenza strain.**

In this reporting week:

- Hospital Surveillance – influenza like illness (ILI) presentations to selected emergency departments increased slightly this week but remain at inter-seasonal levels. The index of increase indicates that seasonal activity peaked on 28 August and fell below the seasonal threshold on 27 September.
- Laboratory surveillance – the total number of influenza isolations decreased further this week with the proportion of respiratory samples positive for influenza at 11.9%.
- Community surveillance – influenza notifications have decreased across the majority of NSW local health districts (LHD). General Practice and community-based surveillance systems showed decreasing ILI activity. Aged care facilities have been affected with 8 new respiratory outbreaks reported this week.
- Deaths - The NSW Registry of Births, Deaths, and Marriages have recorded 147 deaths in association with influenza in 2016. The rate of deaths classified as "pneumonia and influenza" remained low.
- National and international influenza surveillance – the most recent national report suggests influenza activity declined nationally; however, widespread activity continued to be reported in a number of regions. Current influenza strains are well-matched to the 2016 influenza vaccines.
- Recommended composition of 2017 influenza vaccines – the World Health Organization (WHO) has provided recommendations for the 2017 southern hemisphere winter influenza season including one strain change.

About this report:

Health Protection NSW collects and analyses surveillance data on influenza and other respiratory viruses. Surveillance reports are produced weekly commencing in May, and continuing until the end of the influenza season. Monthly reports are produced throughout the rest of the year.

The influenza surveillance reports include data from a range of surveillance systems and sources concerned with Emergency Department illness surveillance, laboratory (virological) surveillance, and community illness surveillance. Pneumonia and influenza mortality data are also monitored and reported upon periodically.

For further information on influenza see the NSW Health Influenza website.

1. Hospital Surveillance

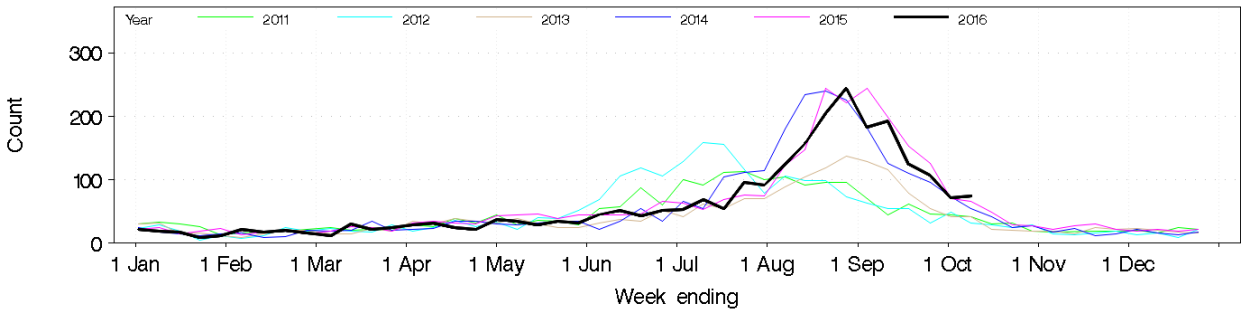
NSW emergency department (ED) presentations for influenza-like illness (ILI) and other respiratory illnesses

Source: PHREDSS [1]

For the week ending 9 October 2016:

- ILI presentations [2] increased this week and were above the usual range for this time of year. ILI presentations were significantly above the five-year mean in people aged 65 years and over (Figure 1 and Table 1).
- The index of increase for ILI presentations was 9.3 on 9 October, slightly higher than the previous week (8.3). Based on the index threshold of 15, this year's influenza season commenced around 26 June 2016, peaked on Sunday 28 August 2016 at 61.0 (lower than the peak of 64.2 seen in 2015) and ended on 27 September 2016.
- The proportion of ILI presentations to all ED presentations was low at 1.7 per 1000 presentations, the same as the previous week.
- ED presentations for pneumonia [3] increased and were above the usual range for this time of year. Presentations were significantly above the five-year mean in people aged 65 years and over and in the Hunter New England LHD and at Campbelltown Hospital (Table 1.)
- ILI presentations which resulted in admission increased and were above the usual range for this time of year (Figure 2 and Table 1).
- Admissions for pneumonia decreased but were above the usual range for this time of year (Table 1). Admissions were significantly above the five-year mean at Campbelltown Hospital. Pneumonia and ILI presentations which resulted in admission to critical care increased but were within the usual range for this time of year (Figure 3 and Table 1).
- Bronchiolitis presentations this week decreased however were above the usual range for this time of year (Table 1).
- Presentations in the category combining all respiratory, fever and unspecified infections were steady and were above the usual range for this time of year. Presentations were significantly above the five-year mean in people aged 0-4 years and 17 years and over and in the South Western Sydney, Western Sydney and Hunter New England LHD's (Table 1).

Figure 1: Total weekly counts of ED visits for influenza-like illness, all ages, from 1 January – 9 October 2016 (black line), compared with each of the 5 previous years (coloured lines).



[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 are included representing approximately 82% of ED visits in the 2015-16 financial year. The coverage of rural EDs is lower than metropolitan EDs. Data shown represents unplanned presentations to hospital 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] 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'.

Figure 2: Total weekly counts of ED presentations for influenza-like-illness that were admitted, all ages, from 1 January – 9 October 2016 (black line), compared with each of the 5 previous years (coloured lines).

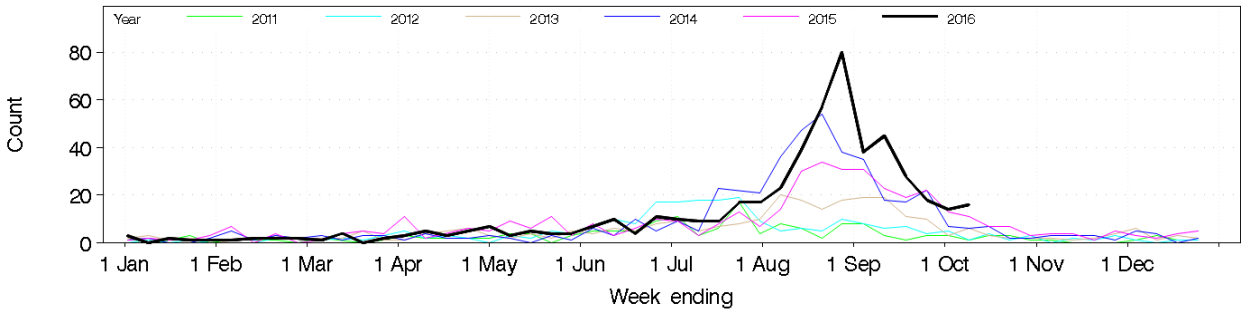


Figure 3 Total weekly counts of ED presentations for pneumonia or influenza-like illness and admitted to a critical care ward, all ages, from 1 January – 9 October 2016 (black line), compared with each of the 5 previous years (coloured lines).

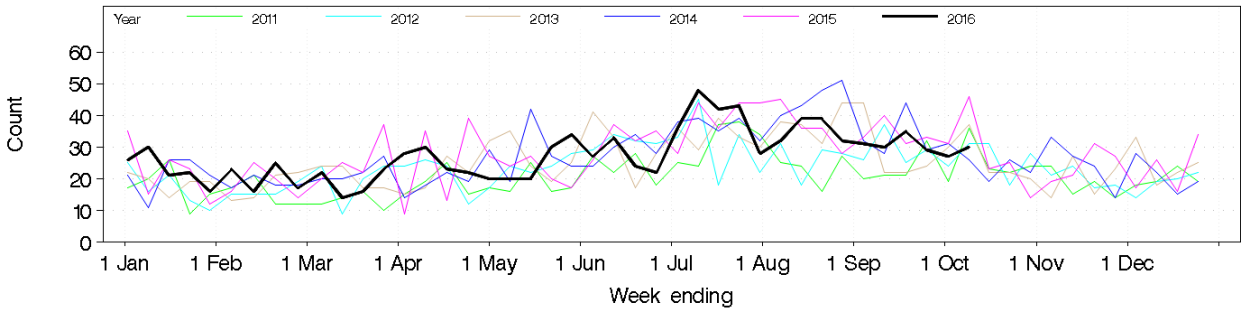


Table 1: Weekly ED and Ambulance Respiratory Activity Summary for the week ending 9 October 2016. Includes data from 60 NSW EDs and the NSW Ambulance Division [4].

Data source	Diagnosis or problem category	Trend since last week	Comparison with usual range for time of year*	Statistically significant age groups (if any)	Locations with weekly counts significantly above the 5 year mean	Severity indicators** with weekly counts significantly above the 5 year mean	Comment
ED presentations, 60 NSW hospitals	Influenza-like illness (ILI)	Increased	**Above**	**65+years**			**Daily index of increase = 9.3 (presentations peaked 28/8 2016)**
	ILI Admissions	Increased	**Above**				
	Pneumonia	Increased	**Above**	**65+years**	**Hunter New England LHD Campbelltown Hospital**	**Admitted (not to critical care)**	
	Pneumonia and ILI admissions	Decreased	**Above**		**Campbelltown Hospital**		
	Pneumonia and ILI critical care admissions	Increased	Usual				
	Asthma	Decreased	Usual				
	Bronchiolitis	Decreased	**Above**				Bronchiolitis is a disease of infants. **Daily index of increase = 13.9**
	Breathing problems	Decreased	**Above**	**0-4 years**		**Admitted (not to critical care)**	
	All respiratory illness, fever and unspecified infections	Steady	**Above**	**0-4 years 17+ years**	**South Western Sydney LHD Western Sydney LHD Hunter New England LHD**	**Admitted (not to critical care)**	

[4] Notes for Table 1: *The usual range for the time of year is the range of weekly counts for the same week in the previous five years for ED presentations. Key: Non-bold and green =usual range; Non-bold and orange= above usual range, but not significantly; Bold and red = statistically greater than usual range. Counts are statistically significant if they are at least five standard deviations above the five-year mean for ED presentations; the ILI 'daily index of increase' is statistically significant above a threshold of 15. **Severity indicators include: Admission to a ward or critical care service; Triage category 1; Ambulance arrival and Death in ED.

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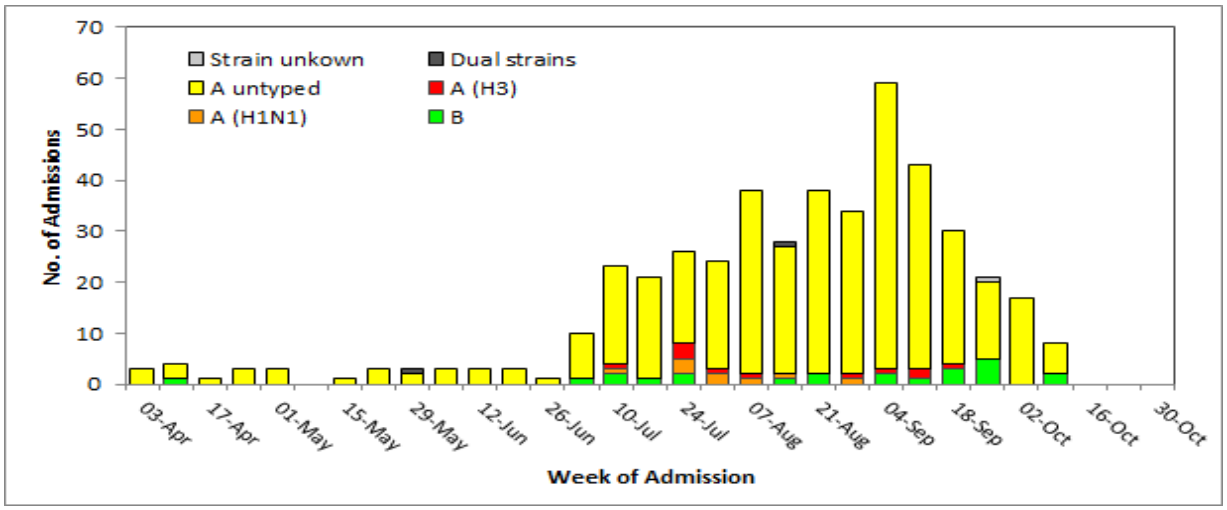
FluCAN (The Influenza Complications Alert Network)

In 2009, the FluCAN surveillance system was created to be a rapid alert system for severe respiratory illness requiring hospitalisation. Data is provided on patients admitted with influenza confirmed by polymerase chain reaction (PCR) testing.

In NSW, three hospitals participate in providing weekly FluCAN data: Westmead Hospital, John Hunter Hospital and the Children's Hospital at Westmead.

- During week 40 there were 8 influenza admissions (7 adults and 1 child) in NSW sentinel hospitals (Figure 5).
- Since 1 April 2016, there have been 450 hospital admissions reported for influenza; 424 with influenza A, 23 with influenza B, two with co-infections and one strain unknown (Figure 4).
- Of these admissions, 121 were paediatric (<16 years of age) cases and 329 were in adults. Thirty cases were admitted to ICU/HDU.

Figure 4: FluCAN – Number of confirmed influenza hospital admissions in NSW, 03 April – 9 October, 2016.



2. Laboratory Surveillance

For the week ending 9 October 2016 the number and proportion of respiratory specimens reported by NSW sentinel laboratories [5] which tested positive for influenza A or influenza B continued to decrease and is expected to reach pre-seasonal level over the next few weeks. The peak of activity for 2016 occurred during the week ending 4 September (Table 2).

A total of 6,333 tests for respiratory viruses were reported this week with 11.9% testing positive for influenza viruses, down from 8,155 tests and a 13.7% influenza-positive rate in the previous week. Influenza A(H3N2) is the dominant circulating influenza strain while influenza B activity remains at a low level (Figures 5 and 6).

Rhinovirus was the leading respiratory virus reported, with other viruses circulating at usual but increasing levels for this time of year (Table 2).

[5]: 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.

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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 2: Summary of testing for influenza and other respiratory viruses at NSW laboratories, 1 January to 9 October 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
Week ending																	
09/10/2016	6333	648	(10.2%)	45	(6.9%)	6	(0.9%)	597	(92.1%)	105	(1.7%)	246	316	234	1047	401	85

Notes: * Five-week reporting period. ** Human metapneumovirus

Figure 5: Weekly influenza positive test results by type and sub-type reported by NSW sentinel laboratories, 1 January to 9 October 2016.

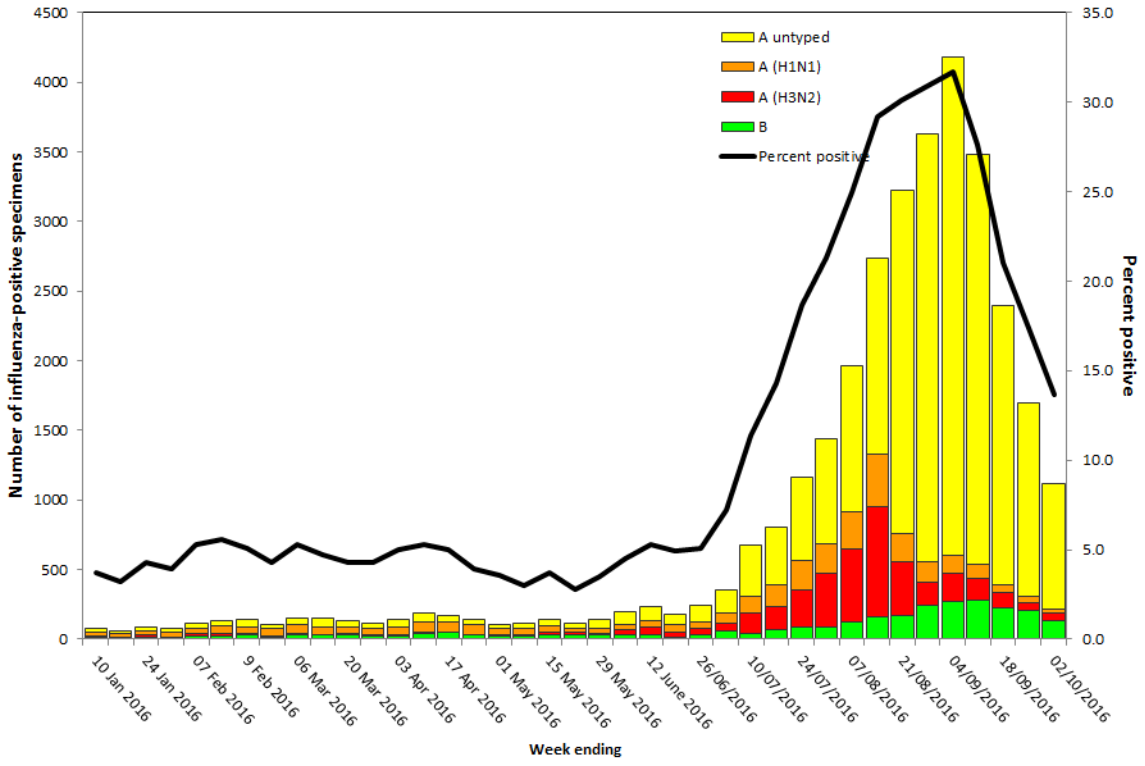


Figure 6: Percentage of laboratory tests positive for influenza A and influenza B by week, 1 January 2016 to 9 October 2016, New South Wales.

3. Community Surveillance

Influenza notifications by Local Health District (LHD)

In the week ending 9 October there were 614 notifications of influenza confirmed by polymerase chain reaction (PCR) testing, lower than the 958 notifications in the previous week.

Population rates were highest in Western Sydney, Hunter New England and Northern Sydney LHDs (Table 3). Notifications decreased in all areas compared to the previous week with the exception of Western Sydney.

Table 3: Weekly notifications of laboratory-confirmed influenza by local health district.

Local Health District	Week ending 09 Oct 2016		Average (previous 4 weeks)	
	Number of notifications	Rate per 100 000 population	Number of notifications	Rate per 100 000 population
Central Coast	23	6.8	95	27.95
Far West	0	0	2	6.56
Hunter New England	108	11.78	274	29.9
Illawarra Shoalhaven	14	3.48	92	22.78
Mid North Coast	8	3.68	35	16.09
Murrumbidgee	21	8.79	109	45.44
Nepean Blue Mountains	38	10.14	125	33.35
Northern NSW	19	6.33	52	17.15
Northern Sydney	106	11.69	377	41.52
South Eastern Sydney	67	7.41	196	21.66
South Western Sydney	34	3.52	233	24.06
Southern NSW	7	3.36	44	21.21
Sydney	32	5.09	145	23.11
Western NSW	19	6.85	60	21.72
Western Sydney	118	12.46	315	33.3

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

Influenza outbreaks in institutions

There were 8 new respiratory outbreaks reported this week, which was more than the previous week (6). All of the outbreaks were due to influenza A and were in residential aged care facilities.

In the year to date there have been 258 laboratory confirmed influenza outbreaks in institutions reported to NSW public health units (Table 4): 250 have been due to influenza A, five were influenza B, and three were combined influenza A and B outbreaks. At least 3,807 residents were reported to have had ILI symptoms and 442 required hospitalisation. One hundred and eighty-eight deaths 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 4).

Table 4: Reported influenza outbreaks in NSW institutions, 1 January 2010 to 9 October 2016.

Year	2010	2011	2012	2013	2014	2015	2016*
Number of outbreaks	2	4	39	12	120	103	258

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)

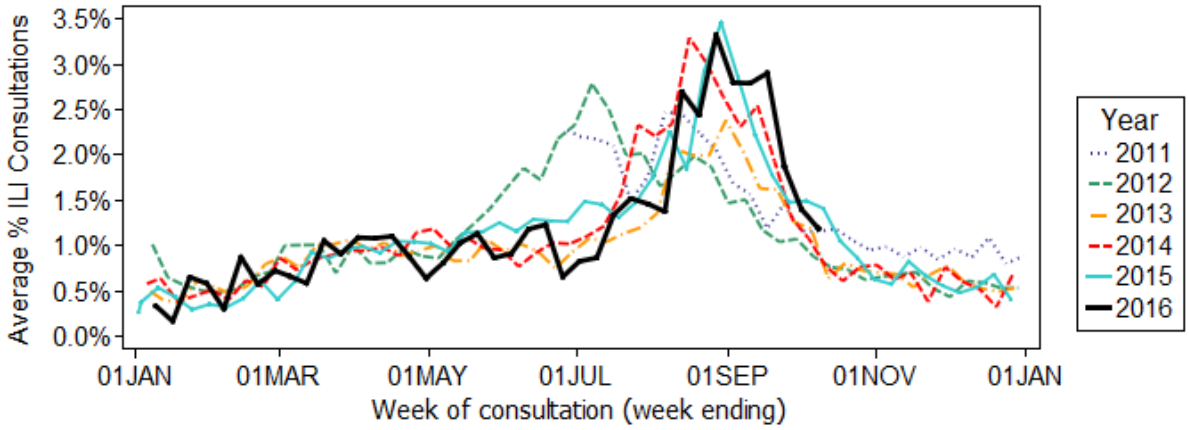
as an indicator of influenza activity. Consultations for ILI are identified each week by an automatic search of electronic records for validated combinations of ILI terms rather than diagnosis codes.

Data generated from eGPS should be interpreted with caution as they are not representative of all practices within the participating LHDs or across NSW.

In Week 40:

- there were 6 surveillance reports received from eGPS sentinel practices in NSW;
- the average rate of ILI patient consultations was 1.2% (range 0.2 – 2.0%), similar to the previous week (1.3%) (Figure 7).

Figure 7. Average rate of influenza-like presentations to sentinel general practices by week of consultation 2011-2016 (year to date).



The Australian Sentinel Practices Research Network (ASPREN)

ASPREN is a network of sentinel general practitioners (GPs) run through the Royal Australian College of General Practitioners and the University of Adelaide which has collected de-identified information on influenza-like illness (ILI) and other conditions seen in general practice since 1991.

Participating GPs in the program report on the proportion of patients presenting with an ILI. The number of GPs participating on a weekly basis may vary.

In week 40 there were 21 ASPREN reports received from NSW GPs. The overall consultation rate for ILI was low at 1.6%, similar to the previous week (1.5%).

For further information please see the ASPREN website.

FluTracking.net

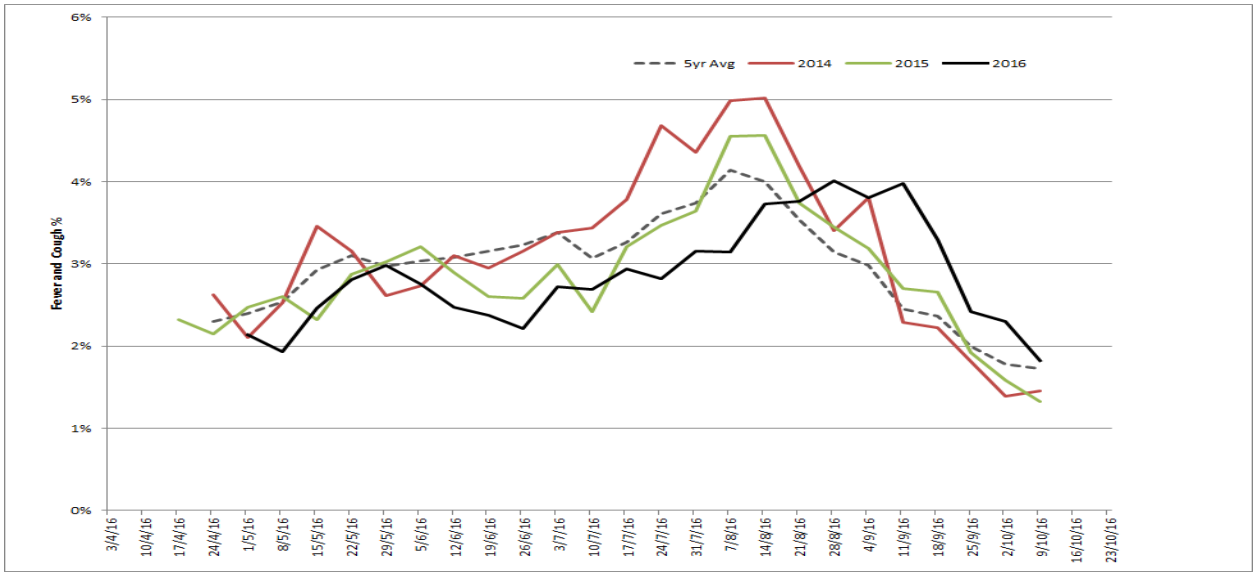
FluTracking.net is an online health surveillance system to detect epidemics of influenza. FluTracking is a project of the University of Newcastle, the Hunter New England Local Health District and the Hunter Medical Research Institute.

Participants complete a simple online weekly survey which is used to generate data on the rate of ILI symptoms in communities.

In week 40 FluTracking received reports for 7,102 people in NSW with the following results:

- 1.8% of respondents reported fever and cough, lower than the previous week (2.3%) (Figure 8).
- 1.2% of respondents reported fever, cough and absence from normal duties, similar to the previous week (1.3%) (data not shown).

Figure 8: FluTracking – weekly influenza-like illness reporting rate, NSW, 2011 – 2016.



For further information please see the FluTracking website.

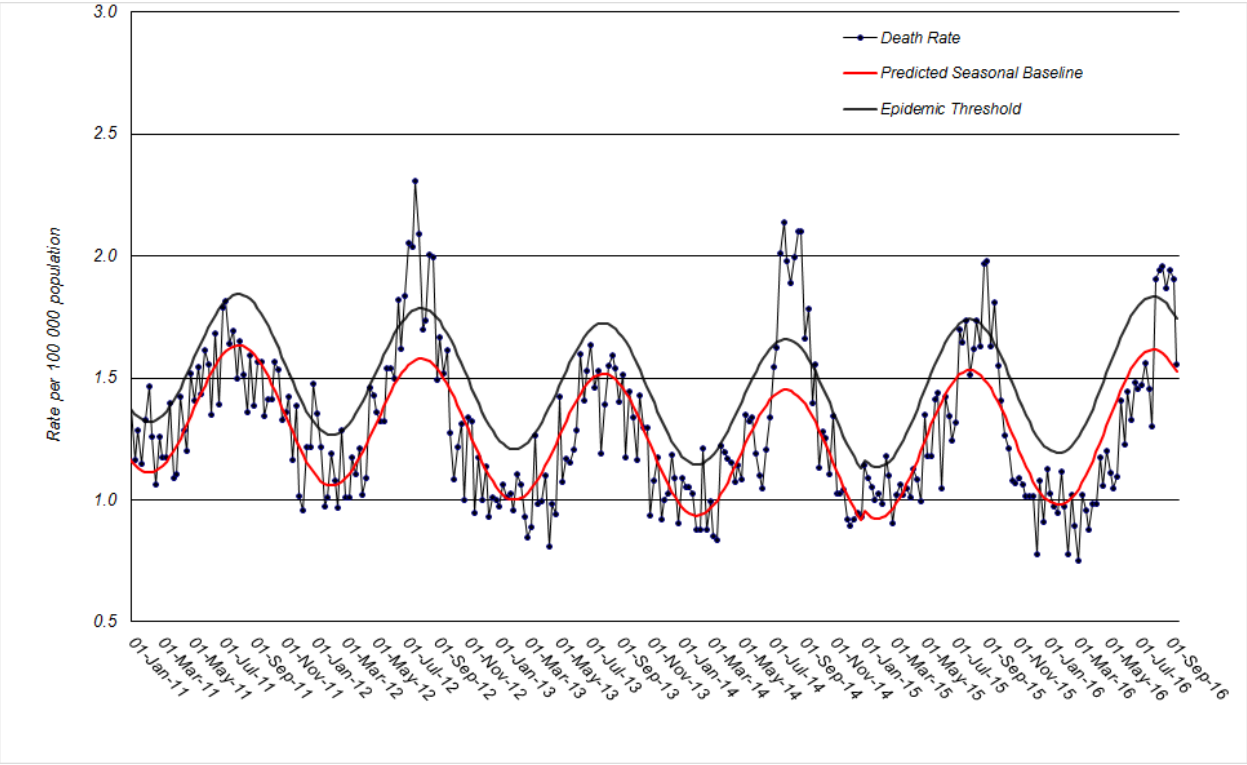
4. Deaths with pneumonia or influenza reported on the death certificate

Deaths registration data is routinely reviewed for deaths attributed to pneumonia or influenza. Pneumonia has many causes; however an increase in the number of death certificates that mention pneumonia or influenza as a cause of death is an indicator of seasonal and pandemic influenza activity. 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 it may be an indication that influenza is circulating at higher than expected levels and/or is affecting more of the people in the community at greater risk of severe influenza complications.

In 2016 up to the week ending 16 September:

- 147 of 37,353 death certificates (0.39%) recorded influenza: deaths were in people aged over 65 years apart from one death in each of the 25-34, 35-44 age groups and 5 deaths in the 55-64 years age group.
- 3,563 of 37,353 death certificates (9.5%) mentioned pneumonia.
- There were 1.56 “pneumonia and influenza” deaths per 100,000 NSW population, which was below the epidemic threshold of 1.74 per 100 000 population (Figure 9).

Figure 9: Rate of deaths classified as “pneumonia and influenza” per 100,000 NSW population, 2011 – 16 September 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 populations. 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 several weeks behind reports from emergency departments and laboratories. In addition, previous weekly rates may also change due to longer delays in reporting some deaths.

5. National and International Influenza Surveillance

National Influenza Surveillance

In the *Australian Surveillance Report No.9,* with data up to 30 September 2016, influenza activity has continued to decline following a seasonal peak in early September.

Of note:

- In the fortnight ending 30 September 2016, influenza activity was stable or decreasing across most regions in the country, with the exception of the Top End of the Northern Territory where activity continued to increase.
- National indicators of influenza-like illness (ILI) continued to decline this fortnight, with influenza remaining the primary cause of ILI presentations to sentinel general practitioners. However, influenza A and rhinovirus were the respiratory viruses most commonly detected by sentinel laboratories.
- Influenza A(H3N2) continued to be the dominant circulating influenza virus nationally.
- 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.
- Clinical severity for the season to date, as measured through the proportion of patients admitted directly to ICU and deaths attributable to pneumonia or influenza, is moderate.
- To date, the seasonal influenza vaccines appear to be a good match for circulating virus strains.

Follow the link for the Australian Influenza Surveillance Reports which provide the latest information on national influenza activity.

Global Influenza Update

The latest WHO global update on 3 October 2016 provides data up to 18 September. Influenza activity varied in countries of temperate South America, is ongoing in South Africa and decreased in Oceania. Influenza activity in the temperate zone of the northern hemisphere was at inter-seasonal levels. 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 19 July 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, no new human infections with A(H5N1), A(H7N9), A(H9N2) and A(H1N2)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.

6. 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/