

Influenza Monthly Epidemiology Report, NSW

December 2015 (including a summary for the year 2015)

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

In December 2015:

- 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 was low and below the epidemic threshold.
- Of 11 376 respiratory specimens tested, 167 (1.5%) were positive for influenza which indicates activity is low. Influenza A viruses (particularly A (H1N1)) predominated over B strains.

From 1 January to 31 December 2015:

- ILI presentations to selected emergency departments were significantly increased during the period July to October. During this period presentations were significantly above the normal expected range.
- 10,513 cases of laboratory confirmed influenza A were reported in NSW, of which 3,856 (37%) were H3 and 1,520 (14%) were pH1N1. The remaining 5,179 cases were untyped.
- 18,978 cases of influenza B were reported in NSW, both influenza B/Phuket (Yamagata lineage) and B/Brisbane (Victoria lineage) circulated throughout the season.
- The predominance of B strains over A strains throughout the 2015 influenza season was a notable change away from the predominance of A strains in recent years.
- At least 133 patients with confirmed influenza were admitted to intensive care or coronary care units.
- 14 cases of influenza with severe complications in children less than 15 years of age in NSW were reported to the Australian Paediatric Surveillance Unit (APSU), including one death.
- 82 deaths in association with influenza in 2015 were reported.
- 103 influenza outbreaks occurred in residential care facilities.

2. Hospital Surveillance

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

[1] NSW Health Public Health Rapid, Emergency Disease and Syndromic Surveillance system. Managed by the Centre for Epidemiology and Evidence, NSW Ministry of Health. Data from 59 NSW emergency departments are included.

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

In December 2015:

- The index of increase for ILI presentations was 1.5 at the end of December, well below the seasonal threshold.
- 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 elevated throughout December but have returned to within the usual range for this time of year. Admissions were significantly elevated at Concord Hospital (Figure 3).
- Bronchiolitis presentations increased but were within the usual range for this time of year. Presentations were elevated at Bathurst Base and Goulburn Base Hospitals (Figure 4).

From January 1 to December 31 2015

- The index of increase crossed the threshold level of 15 on 26 June (indicating the start of the influenza season) and peaked at 64.2 on 19 August, higher than the 2014 peak of 50.7.
- Overall, ILI presentations were similar to those seen in 2014 but with a later peak (Figure 1).

Figure 1: Total weekly counts of ED visits for influenza-like illness, from January – December 2015 (black line), compared with each of the 5 previous years (coloured lines), for 59 NSW hospitals.*

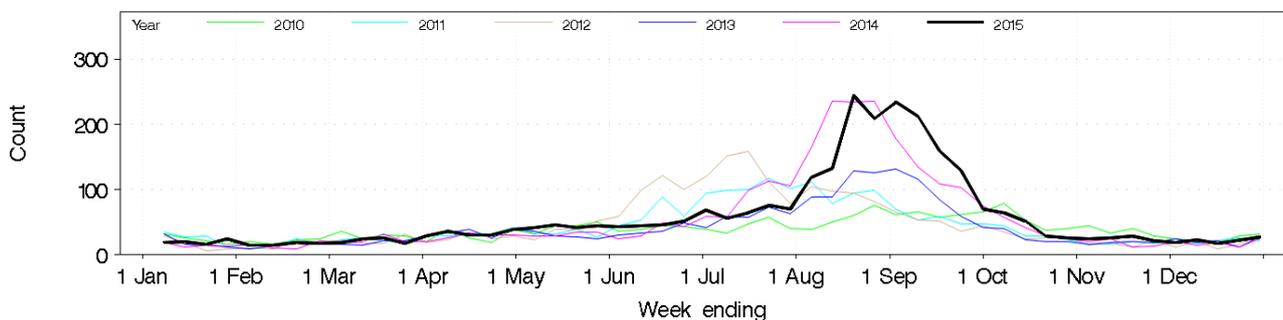


Figure 2: Total weekly counts of ED presentations for pneumonia, from January – December 2015 (black line), compared with each of the 5 previous years (coloured lines), for 59 NSW hospitals.

Comparisons are made with data for the preceding five years. Recent counts are subject to change. This includes data from 59 NSW emergency departments (EDs), representing approximately 85% of metropolitan ED presentations and approximately 60% of rural ED presentations.

[2] ILI is when the treating ED doctor makes a provisional clinical diagnosis of ILI Syndrome, which includes: 'influenza-like illness' or 'influenza' (including 'pneumonia with influenza').

[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'.

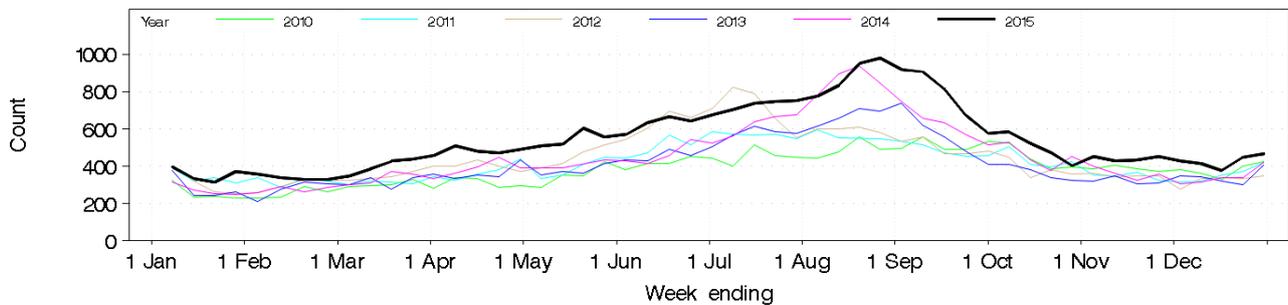


Figure 3: Total weekly counts of ED presentations for pneumonia or influenza-like illness and admitted to a critical care ward, from January – December 2015 (black line), compared with each of the 5 previous years (coloured lines), for 59 NSW hospitals

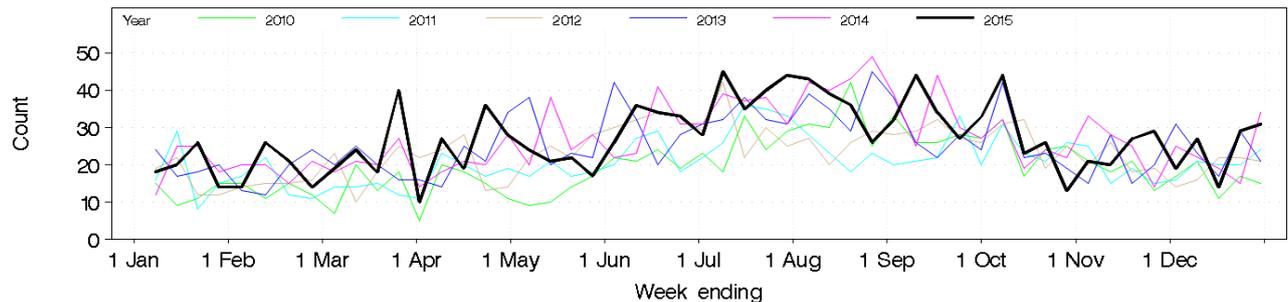
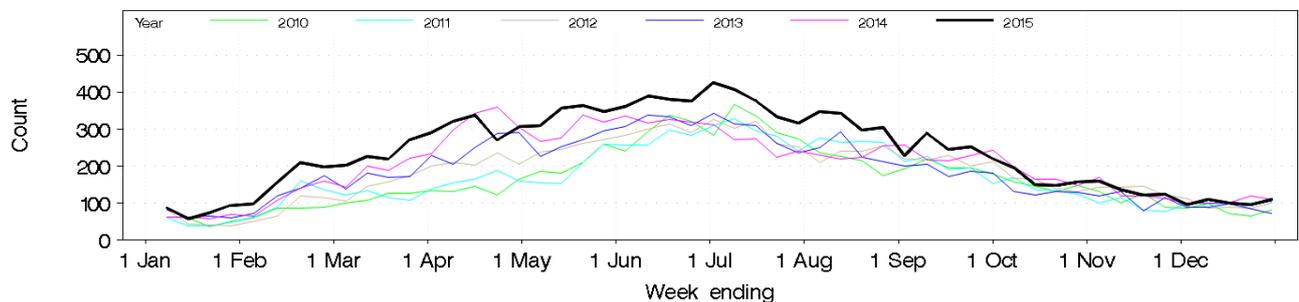


Figure 4: Total weekly counts of ED presentations for bronchiolitis, from January - December 2015 2016 (black line), compared with each of the five previous years (coloured lines), persons of all ages, for 59 NSW hospitals.



APSU Paediatric Surveillance of influenza with severe complications

The Australian Paediatric Surveillance Unit (APSU) is a national research resource, established in 1993 to facilitate active surveillance of uncommon childhood diseases, rare serious complications of common diseases or rare adverse effects of treatment. Conditions are chosen for their public health importance and impact on health resources.

The APSU is based at The Children’s Hospital at Westmead. Contributors to the APSU are clinicians working in paediatrics and child health in Australia.

Each month all clinicians participating in APSU surveillance are sent a report card listing up to 17 different conditions under surveillance and asked to return the report card indicating whether they have seen a case or not. All positive reports of cases generate a brief questionnaire requesting de-identified information about the child’s demographics, details of diagnosis, management and short-term outcome from the clinician. (For more details on APSU methods please see the APSU website: www.apsu.org.au).

Since 2009, surveillance for severe complications from influenza has been conducted by the APSU from July to September. For this reporting period in 2015 there were 14 cases of influenza with severe complications in children less than 15 years of age in NSW reported to the APSU:

- Two cases involved infections with influenza A strains and 12 cases resulted from influenza B infection. Eight (57%) cases were female. The median age of cases was 5.1 years (range 0.5-13.7 years).
- Five of the cases were known to have not been vaccinated for influenza while the influenza vaccination status of the other 9 cases was unknown.
- Eight of the cases had an underlying chronic medical condition.
- Eight cases required intensive care admission during their hospitalisation.

There was one fatal case; a four year old child who had no underlying co-morbidities. The most common influenza complications were pneumonia with oxygen requirement (11 cases), two cases had encephalitis (one death) and one case had a co-infection with HMPV. Thirteen cases were discharged after hospital stays ranging from 1 to 25 days.

3. Influenza Complications Alert Network (FluCAN)

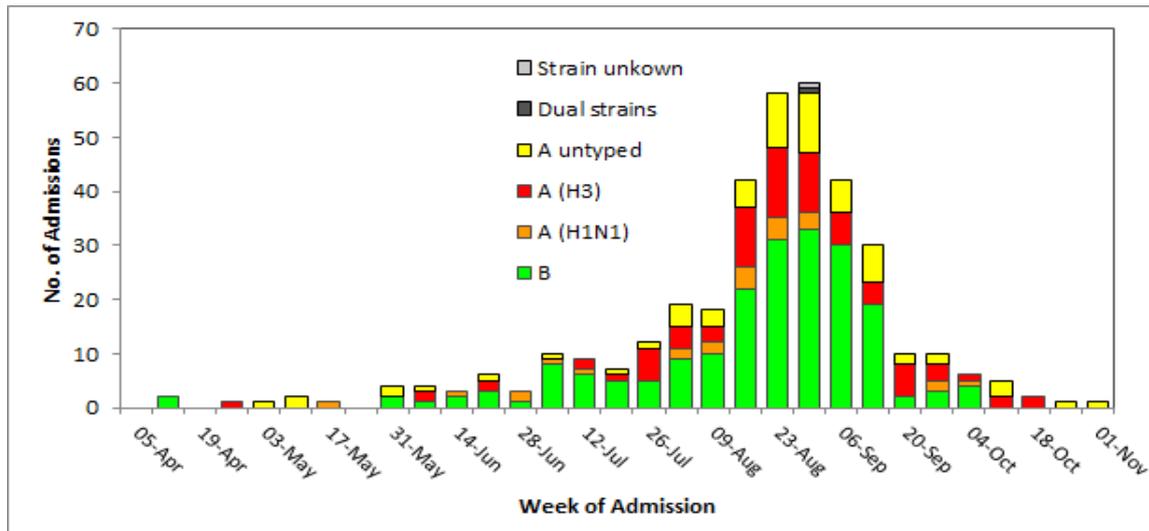
In 2009, [A Rapid Alert System for Severe Respiratory Illness: The FluCAN Surveillance system](#) was created with the involvement and support of the Thoracic Society of Australia and New Zealand and funding from the [NHMRC](#).

The aim of FluCAN was to establish and maintain a real-time sentinel hospital surveillance system for acute respiratory disease requiring hospitalisation, which could provide a reliable and timely source of information that could be used to inform public health policy. Since 2010, this FluCAN surveillance has been supported by the Department of Health, with data management provided by Monash University, Melbourne. In NSW, the FluCAN includes three sentinel monitoring sites for influenza hospitalisations: The Children's Hospital at Westmead, John Hunter Hospital and Westmead Hospital.

From 5 April to 31 October, FluCAN reported 369 hospital admissions with confirmed influenza from the three NSW sites, and with the following characteristics (Figure 5):

- 335 (91%) were admitted to either a general ward or a respiratory ward and 34 (7%) were admitted to an intensive care unit.
- 169 (46%) of cases were influenza A positive: 24 (14%) had influenza A(H1N1), 80 (47%) had influenza A(H3) and 65 (38%) were untyped.
- 198 (54%) of cases were influenza B.
- 20 of the 34 cases (59%) admitted to ICU were positive for influenza A (9 were A(H3), 5 was A(H1N1) and were untyped and 14 (51%) were influenza B.
- 91 (25%) of cases were children <15 years, 90 (24%) people were aged 15 to 49 years and 188 (51%) were aged 50 years and older.
- 17 (5%) of cases were pregnant women (2 A(H1N1), 2 A(H3), 3 A(untyped) and 10 B).

Figure 5: FluCAN – Number of confirmed influenza hospital admissions in NSW, April – October 2015



4. Laboratory testing summary for influenza

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

In December 2015:

- A total of 11 376 tests for respiratory viruses were performed at sentinel NSW laboratories and 167 (1.5%) were positive for influenza (Table 1). This is within the usual range for this time of year.
- 125 specimens tested positive for influenza A – 24 of these tested positive for A(H3N2), 35 tested positive for influenza A(H1N1) and 67 were not typed further (Table 1, Figure 6 & 7).
- 42 cases of influenza B were reported (Table 1, Figure 6 & 7).

Influenza activity continued to decline and is at low levels. Rhinoviruses were the leading respiratory viruses identified by laboratories; other respiratory viruses were circulating as expected for this time of year.

From 1 January to 31 December 2015:

- 195,814 tests for respiratory viruses were performed at sentinel NSW laboratories ([Table 1](#)).
- 10,513 tests were positive for influenza A ([Table 1](#), Figure 6).
 - 1, 520 were pH1N1 (of these, 36 were characterised as A/California/7/2009-like).
 - 3,856 were H3N2 (of these, 34 were characterised as A/Victoria/361/2011-like).
 - 5,137 influenza A samples were not typed further.
- 18,978 tests were positive for influenza B ([Table 1](#), Figure 6).
 - 173 influenza B samples were sent for further characterisation, with 103 identified as B/Phuket/3073/2013-like (Yamagata lineage) and 70 identified as B/Brisbane/60/2008-like (Victoria lineage).

[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: South Eastern Area Laboratory Services, The Children’s Hospital at Westmead, Sydney South West Pathology Service, Pacific Laboratory Medicine Service, Royal Prince Alfred Hospital, Hunter Area Pathology Service, Pathology West (Westmead & Nepean), Douglas Hanley Moir Pathology, VDRLab, Laverty Pathology, SydPath (St Vincent’s), Medlab, and Laverty. HAPS data not included for week 41 2015.

- Sentinel laboratories reported that at least 133 of the patients with confirmed influenza were known to have been admitted to either an intensive care or coronary care unit.

Table 1: Summary of testing for influenza and other respiratory viruses at sentinel NSW laboratories, 1 January to 3 January 2016.

Month ending	Total Tests	TEST RESULTS																
		Influenza A						Influenza B		Adeno	Parainf 1, 2 & 3	RSV	Rhino	Entero	HMPV **			
		Total		H3N2		H1N1 pdm09		A (Not typed)								Total		
Total	(%)	Total	(%A)	Total	(%A)	Total	(%A)	Total	(%)									
01/02/2015*	5920	182	(3.1%)	40	(22.0%)	11	(6.0%)	131	(72.0%)	55	(0.9%)	150	181	181	607	59	49	
01/03/2015	6287	212	(3.4%)	72	(34.0%)	14	(6.6%)	126	(59.4%)	75	(1.2%)	128	83	271	842	24	29	
29/03/2015	8577	242	(2.8%)	87	(36.0%)	21	(8.7%)	135	(55.8%)	108	(1.3%)	181	117	767	1084	52	34	
03/05/2015*	12584	285	(2.3%)	125	(43.9%)	13	(4.6%)	147	(51.6%)	163	(1.3%)	257	187	1351	1443	59	78	
31/05/2015	12244	128	(1.0%)	42	(32.8%)	9	(7.0%)	83	(64.8%)	200	(1.6%)	272	167	1276	1514	64	64	
28/06/2015	15431	297	(1.9%)	56	(18.9%)	16	(5.4%)	225	(75.8%)	581	(3.8%)	378	183	1585	2027	96	135	
02/08/2015*	22771	1125	(4.9%)	332	(29.5%)	141	(12.5%)	654	(58.1%)	2125	(9.3%)	721	273	1878	2484	149	425	
30/08/2015	32606	3717	(11.4%)	1435	(38.6%)	599	(16.1%)	1715	(46.1%)	7819	(24.0%)	747	295	1014	2369	69	445	
04/10/2015*	39698	3536	(8.9%)	1354	(38.3%)	595	(16.8%)	1587	(44.9%)	7092	(17.9%)	1159	577	745	2576	78	626	
01/11/2015	15305	528	(8.9%)	238	(38.3%)	50	(16.8%)	240	(44.9%)	612	(17.9%)	520	401	165	1589	63	253	
29/11/2015	13015	136	(8.9%)	51	(38.3%)	16	(16.8%)	69	(44.9%)	106	(17.9%)	444	296	141	2120	116	144	
03/01/2016	11376	125	(8.9%)	24	(38.3%)	35	(16.8%)	67	(44.9%)	42	(17.9%)	346	290	190	1733	136	126	
Week ending																		
06/12/2015	2710	27	(1.0%)	13	(48.1%)	5	(18.5%)	9	(33.3%)	12	(0.4%)	82	61	32	411	30	26	
13/12/2015	2719	26	(1.0%)	4	(15.4%)	7	(26.9%)	16	(61.5%)	12	(0.4%)	83	59	36	398	29	25	
20/12/2015	2540	25	(1.0%)	4	(16.0%)	6	(24.0%)	15	(60.0%)	9	(0.4%)	82	56	33	387	31	32	
27/12/2015	1973	23	(1.2%)	2	(8.7%)	12	(52.2%)	9	(39.1%)	5	(0.3%)	52	64	32	277	26	23	
03/01/2016	1434	24	(1.7%)	1	(4.2%)	5	(20.8%)	18	(75.0%)	4	(0.3%)	47	50	57	260	20	20	

Notes: * Five week reporting period used; ** HMPV - Human metapneumovirus.

Note that while all samples are tested for influenza viruses, not all samples are tested for all of the other viruses listed.

Figure 6: Weekly influenza positive test results by type and sub-type reported by NSW sentinel laboratories, 1 January to 3 January 2016.

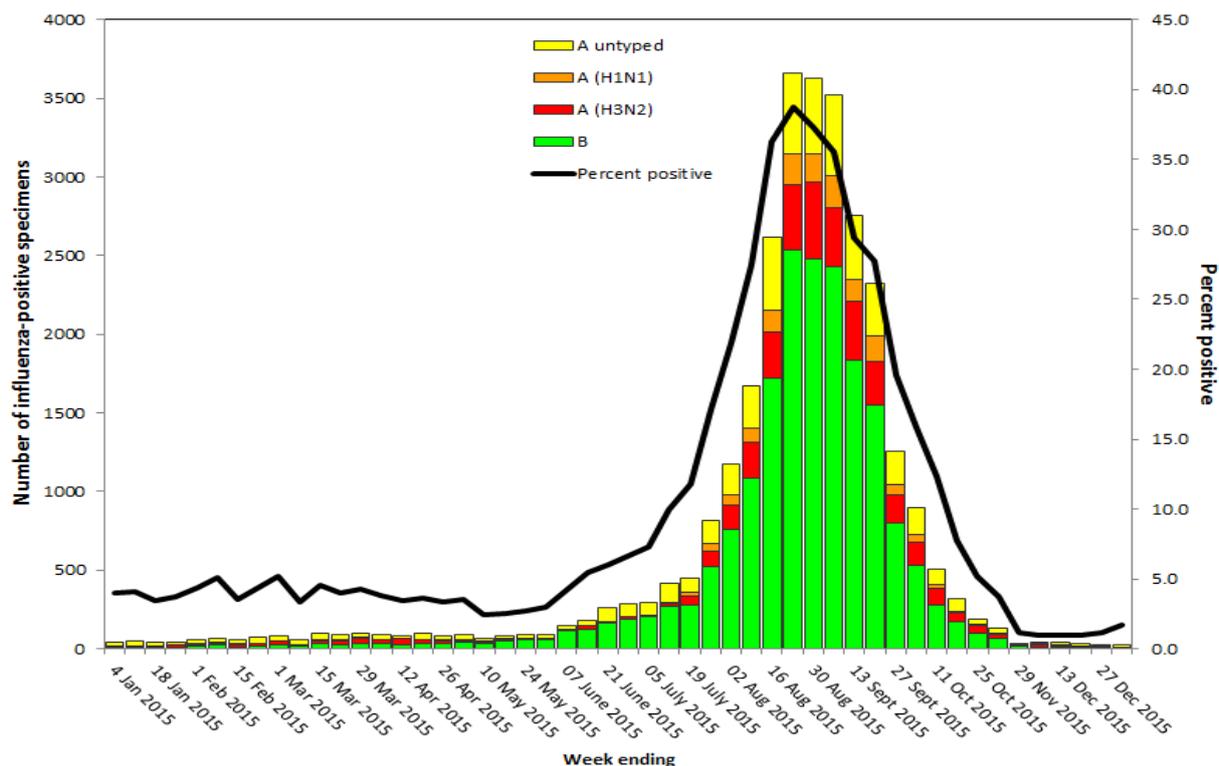
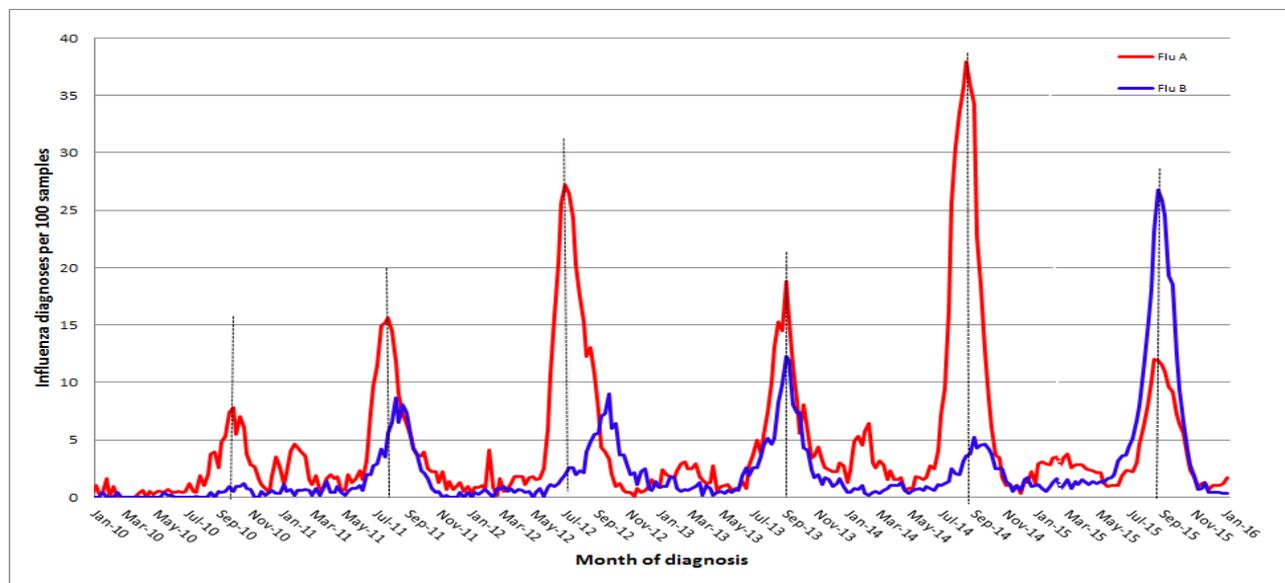


Figure 7: Percent of laboratory tests positive for influenza A and influenza B reported by NSW sentinel laboratories, 1 January 2010 to 3 January 2016.



5. Community Surveillance

Influenza notifications by Local Health District (LHD)

In December 2015:

During December there were 32 notifications of influenza confirmed by polymerase chain reaction (PCR) testing. Notifications have been trending down since September. Rates were low and similar across all LHDs (data not shown).

From 1 January to 31 December 2015:

The highest number of notifications reported (3561) was in week 35 (week ending 30 August) with all Far West NSW reporting high rates of flu activity. Overall Northern NSW LHD and Western Sydney LHD had the highest population rates of influenza (Table 2).

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

Local Health District	January 1 - 31 December 2015	
	Number of notifications	Rate per 100 000 population
Central Coast	740	221
Far West	20	65
Hunter New England	2643	291
Illawarra Shoalhaven	911	228
Mid North Coast	460	214
Murrumbidgee	897	309
Nepean Blue Mountains	1715	466
Northern NSW	765	257
Northern Sydney	5210	580
South Eastern Sydney	4239	475
Southern NSW	377	183
South Western Sydney	3710	393
Sydney	2724	439
Western NSW	366	132
Western Sydney	5304	572

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

Influenza outbreaks in institutions

There was one influenza A outbreak reported in an aged care facility this month (Table 3).

In the year to date, there have been 103 laboratory confirmed influenza outbreaks in institutions reported to NSW public health units (Table 3): 60 have been due to influenza A, 31 due to influenza B and 12 were combined A and B. At least 1489 residents were reported to have had ILI symptoms and 188 required hospitalisation. Sixty 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 and was associated with an increase in influenza outbreaks in institutions, particularly residential aged care facilities (Table 3).

Table 3: Reported influenza outbreaks in NSW institutions per year, 2010-2015.

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

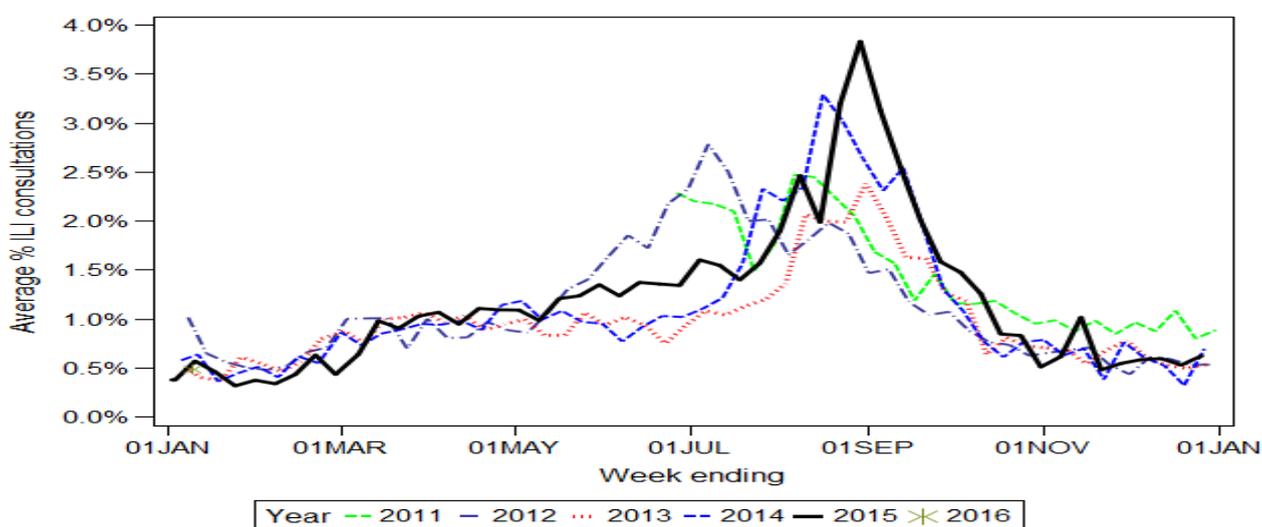
Electronic General Practice Surveillance (eGPS)

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 it is not representative of all practices within the participating LHDs or across NSW.

- For 2015, weekly reports were received on average from 11 sentinel practices.
- The highest weekly ILI activity reported by GP's was during the month of August (week ending 29 Aug) where the average rate for patient consultations with ILI was 3.8% (range 1.5 – 6%). This is much higher than previous years (Figure 8).

Figure 8. ILI consultations as a percentage of all consultations at sentinel general practices, by week of consultation, July 2011 to December 2015.



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.

The Australian Sentinel Practices Research Network (ASPREN)

ASPREN is a network of sentinel general practitioners (GPs) run through the RACGP and University of Adelaide that has collected de-identified information on influenza like illness and other conditions seen in general practice since 1991.

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

- For 2015, an average of 35 NSW GP practices provided activity reports each week.
- The consultation rate peaked at 3.9 per cent during week 35 (week ending 30 August); this was higher than previous years.

For further information please see the [ASPREN](#) website.

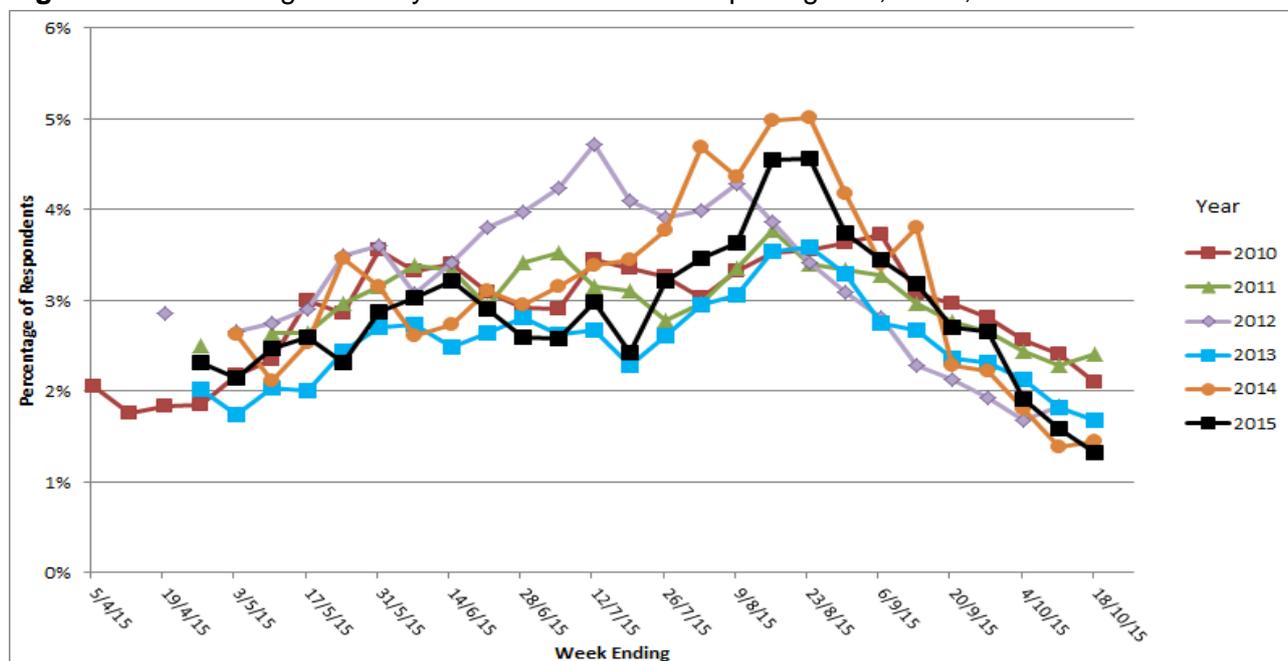
FluTracking.net

FluTracking.net is an online health surveillance system to detect epidemics of influenza. It involves participants from around Australia completing a simple online weekly survey which is used to generate data on the rate of ILI symptoms in communities.

- For 2015, the peak and magnitude of ILI symptom reporting in NSW was similar but lower than that seen in 2014 (Figure 9).

- The highest weekly ILI symptom activity reported from FluTracking participants in NSW was for the week ending 23 of August when reports were received for 6420 individuals. The number of respondents reporting fever and cough for this week was 4.6%, well above the usual range for this time of year but lower than at the peak of activity seen in 2014 (Figure 9).
- Overall, 3.3% of respondents reported fever, cough and absence from normal duties.

Figure 9: FluTracking – Weekly influenza like illness reporting rate, NSW, 2010 – 2015.



For further information please see the [FluTracking](#) website.

6. 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 the week ending 31 December 2015:

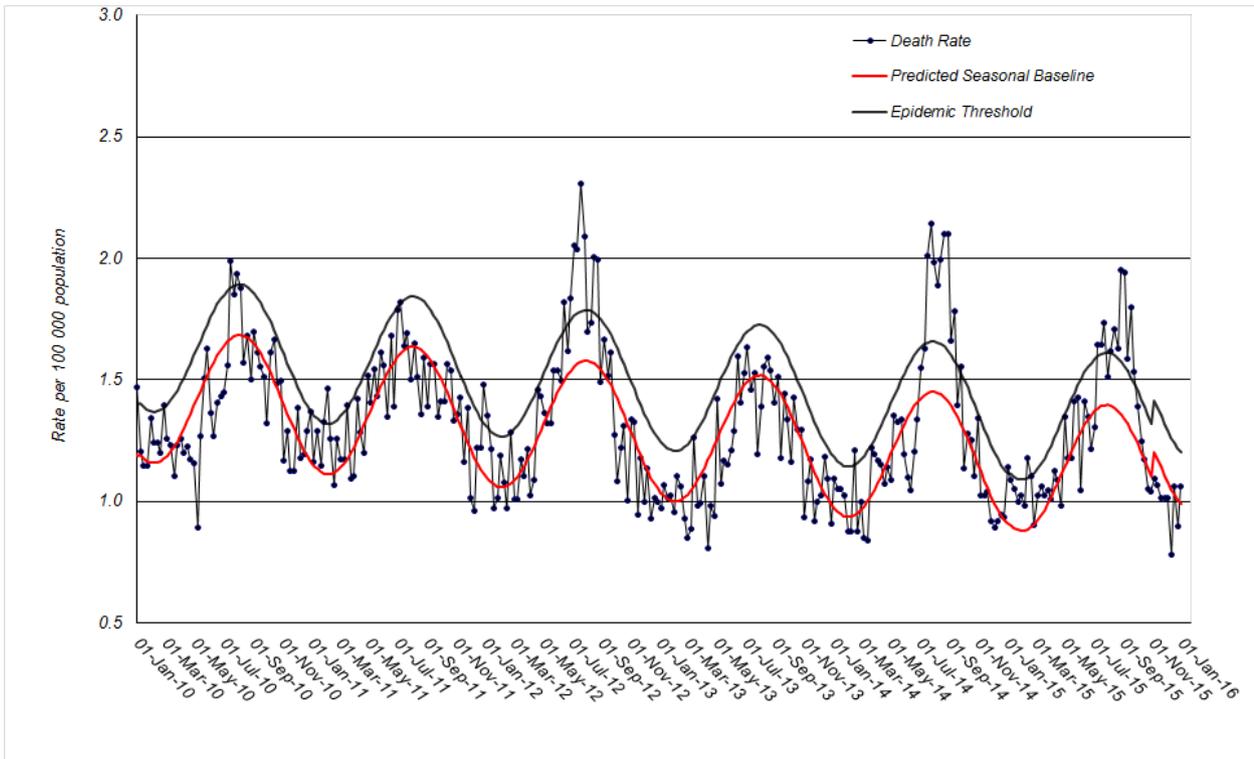
There were 1.06 pneumonia or influenza deaths per 100,000 NSW population, which is below the epidemic threshold of 1.20 per 100,000 population (Figure 10).

From 1 January to 31 December 2015:

- In 2015, of the 52 027 death certificates there were 82 which mentioned influenza: two deaths were in children aged under 5 years, one death in a child aged 5 to 14 years, one death in a 35 year old adults, four deaths in people aged 55 to 64 years and the remainder were in people aged over 65 years.
- A total of 4333 of 52 027 death certificates mentioned pneumonia.
- Death rates for both influenza and pneumonia as a proportion of the NSW population exceeded the forecast epidemic threshold week ending 28 August and remained elevated until week

ending 18 September. Death rates were lower in 2015 compared with the previous year (Figure 10).

Figure10: Rate of deaths classified as influenza and pneumonia per 100 000 NSW population, 2010 - 2015.



Source: NSW Registry of Births, Deaths and Marriages.

Notes on interpreting death data:

- 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.
- 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.
- 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.

7. National and International Influenza Surveillance

Nationally, and in the Australian Capital Territory, New South Wales, Queensland and South Australia, the season peak of laboratory confirmed notifications of influenza occurred in the week ending 21 August. Notifications peaked one week earlier in Western Australia, while Tasmania and the Northern Territory peaked one and four weeks later, respectively.

This year children aged less than 15 years accounted for one-third of all influenza notifications, this compares with one-quarter of all notifications in 2014. Notification rates have been highest among those aged between 5 and 9 and over 85 years with a secondary peak in those aged 35-44 years.

- Notably, the 2015 influenza season was characterised by the predominant circulation of influenza B throughout the season. Influenza B viruses accounted for 62% of all notifications this year. Activity was predominately due to B/Yamagata lineage viruses, with B/Victoria lineage viruses increasing towards the end of the season. Where subtype information was available, A(H3N2) was the predominant influenza A subtype with a ratio of approximately 3 notified cases of A(H3N2) for every notified case of A(H1N1). In recent weeks, notifications of influenza A and B have been close to evenly distributed nationally.
- Overall, people experiencing Influenza-like illness (ILI) this year were reported at rates similar to recent years. This season, age-specific rates of ILI were highest in school-aged children. In addition, the rate of ILI in this group was the highest reported in recent years. Historically, influenza has been the primary cause of ILI throughout winter, however this year other respiratory pathogens, including rhinovirus and RSV, continued to circulate.
- Despite the high levels of notifications reported this year, clinical severity appeared less than last year. Presentations to Emergency Departments remained within the range experienced in recent years, however some jurisdictions reported elevated presentations either widespread or regionally at the peak of the season. There were a similar number of hospitalisations reported as last year, however the overall proportion of patients admitted directly to Intensive Care Units (ICUs) was less, at approximately 7%, compared with 10-12% in recent years. Children were admitted to ICU at a slightly higher rate (9%) than adults. Reported mortality was low to moderate and largely limited to the elderly.
- Admissions to ICU due to influenza A and influenza B were reported at similar proportions, suggesting that, at a type level, clinical severity was similar.
- The seasonal influenza vaccines appear to be a good match for circulating strains with 77% of samples matching the trivalent seasonal vaccine (TIV).

Follow the link for the archive of [Australian Influenza Surveillance Reports](#).

Global Influenza Update

The [WHO global update on 14 December 2015](#) provides data up to 13 December. Influenza activity was reported as low in most parts of the world with the exception of western Asia and Bahrain, Oman and Qatar where increased influenza activity was reported, mainly due to the influenza A (H1N1) strain.

Follow the link for the [WHO influenza surveillance reports](#).

Avian Influenza Update:

Human infections with avian influenza viruses

WHO has published its monthly updated risk assessment of human infections with avian influenza viruses [Influenza at the human-animal interface](#) as of 13 November 2015. This report provides updated information on human cases of infection with H5 and H7 clade viruses and outbreaks among animals.

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.

For H7N9, WHO has noted current evidence suggests that this virus has not acquired the ability of sustained transmission among humans but it is possible that limited human-to-human transmission may have occurred where there was unprotected close contact with symptomatic human cases.

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](#).

8. Composition of 2016 Australian influenza vaccines

The WHO Consultation on the Composition of Influenza Vaccines for the 2016 Southern Hemisphere was held in Memphis on 21-23 September 2015. Following the Consultation, WHO announced its recommendations for the composition of trivalent vaccines for use in the 2016 influenza season (southern hemisphere winter) as follows:

- an A/California/7/2009 (H1N1)pdm09-like virus;
- an A/Hong Kong/4801/2014 (H3N2)-like virus;
- a B/Brisbane/60/2008-like virus (Victoria lineage).

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

This is a change to both the A/H3 (previously A/Switzerland) and B (previously B/Phuket Yamagata lineage) viruses from the vaccine recommendations for the southern hemisphere in 2015 and the northern hemisphere in 2015-2016. More details about the most recent recommendations can be found at: http://www.who.int/influenza/vaccines/virus/recommendations/2016_south/en/ .

The Commonwealth Government has announced that trivalent influenza vaccines will be replaced by quadrivalent vaccines in the National Immunisation Program (NIP) for 2016. For further information see: <http://www.health.gov.au/internet/ministers/publishing.nsf/Content/health-mediarel-yr2015-ley133.htm> .