

Influenza Monthly Epidemiology Report, NSW

December 2013 (including a summary for the year 2013)

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 2013:

- The rate of influenza like illness (ILI) presentations to selected emergency departments was low and was within the normal range expected for December.
- 80 cases with laboratory-confirmed influenza A (predominantly H3N2) and 38 cases with influenza B were identified by sentinel laboratories.
- Rhinovirus was the most common respiratory virus identified by sentinel laboratories.

From 1 January to 28 December 2013:

- ILI presentations to selected emergency departments remained low overall, but increased during the period August to September. During this period presentations were above the normal expected range.
- 3,716 cases of laboratory confirmed influenza A were reported in NSW, of which 440 (12%) were H3 and 1891 (51%) were pH1N1. The remaining 1,385 cases were untyped.
- 2,404 cases of influenza B were reported in NSW.
- At least 119 patients with confirmed influenza were admitted to intensive care units
- 7 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 two deaths.
- The NSW Registry of Births, Deaths, and Marriages recorded 35 deaths in association with influenza in 2013, with overall mortality due to influenza or pneumonia lower than 2012.

2. Emergency Department (ED) presentations

Data from 59 NSW emergency departments are included. Comparisons are made with data for the preceding six years. Recent counts are subject to change.

Source: NSW Health Public Health Real-time Emergency Department Surveillance System (PHREDSS) managed by the Centre for Epidemiology and Evidence, NSW Ministry of Health.

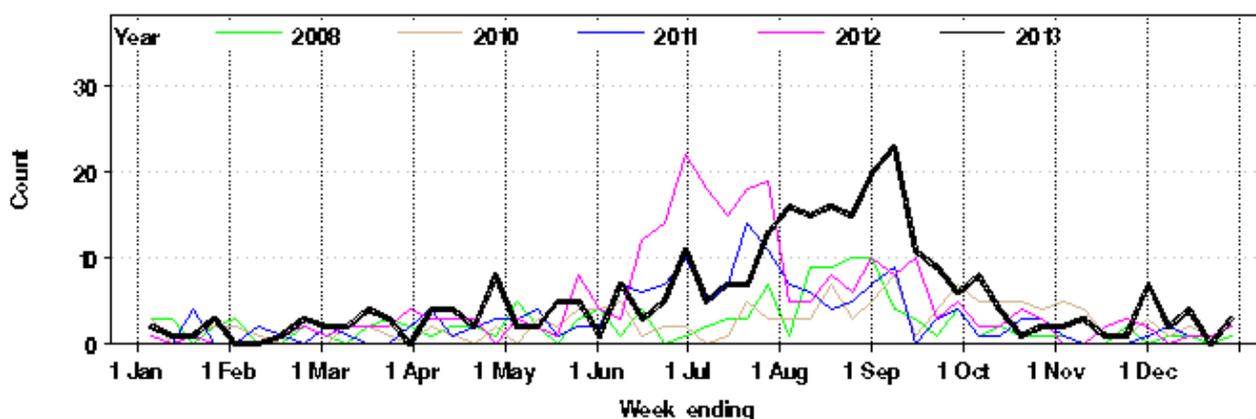
Presentations for influenza-like illness:

The ED surveillance system uses a statistic called the 'index of increase' to indicate when presentations 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.

- On 29 December 2013, the index of increase for ILI presentations was 2.6. The index remained below 2.6 for the period of December.
- In December 2013 there were 75 presentations with influenza-like illness (rate 0.4 per 1,000 presentations). The rate of influenza-like illness presentations to EDs in December was lower than the previous month (November – 87 presentations, rate 0.5 per 1,000 presentations), and compares to the count of 65 (rate 0.4 per 1,000 presentations) for the month of December in 2012. The total count for ILI presentations was within the historical average for November (Figure 1).
- For 2013, monitoring of the index of increase suggests that this year’s influenza season started around 26 June, peaked on 20 August and ended around 17 September. However the number of presentations to EDs for influenza-like illness was highest in early September at 137 presentations per week. ILI presentations were similar to the previous year although the majority of presentations occurred later in the season (Figure 1).

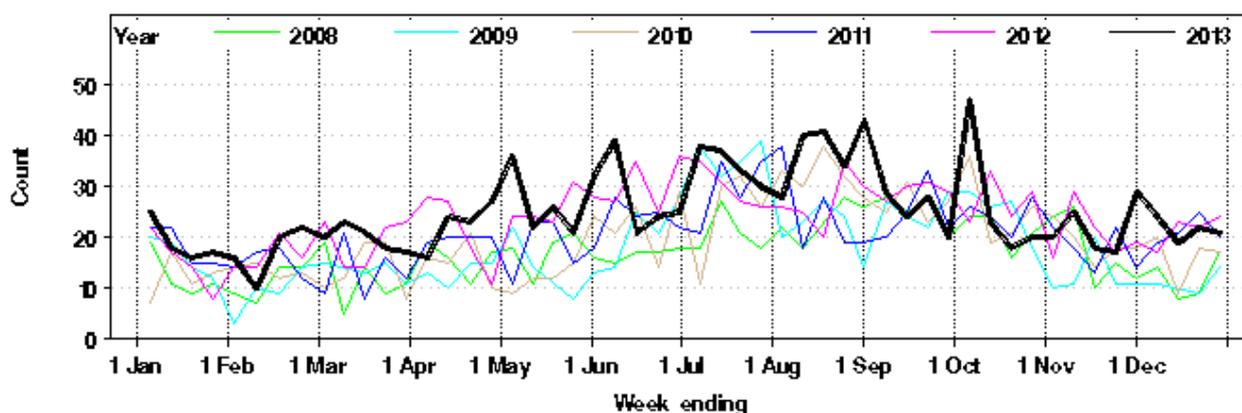
Figure 1: Total weekly counts of Emergency Department visits for influenza-like illness, from January – December 2013 (black line), compared with each of the 5 previous years (coloured lines), for 59 NSW hospitals.*



* Excludes 2009 data to enable comparison of 2013 data with data from previous non-pandemic years

- Admissions from ED to critical care units for influenza-like illness and pneumonia were steady for all of December, and were within the usual range for this time of year (Figure 2).
- For 2013, critical care admissions from ED departments peaked in early October and overall throughout the year were similar to the previous year although the majority of admissions occurred later in the season (Figure 2).

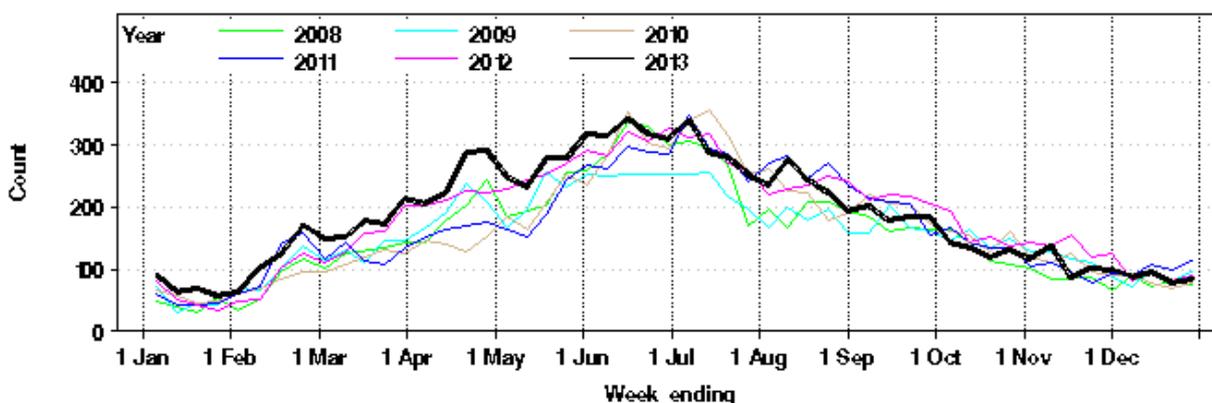
Figure 2: Total weekly counts of Emergency Department visits for pneumonia and influenza-like illness, which were subsequently admitted to a critical care ward, from January – December 2013 (black line), compared with each of the 5 previous years (coloured lines), for 59 NSW hospitals.



Bronchiolitis presentations:

- In December 2013, total ED presentations for bronchiolitis were similar to the usual range for this time of year (Figure 3).
- For 2013, the number of presentations to EDs for bronchiolitis was highest in June and July, and remained within the usual range for the remainder of the year (Figure 3).

Figure 3: Total weekly counts of Emergency Department visits for bronchiolitis, from January – December 2013 (black line), compared with each of the 5 previous years (coloured lines), for 59 NSW hospitals.



3. Community Illness Surveillance

Electronic General Practice Surveillance (eGPS)

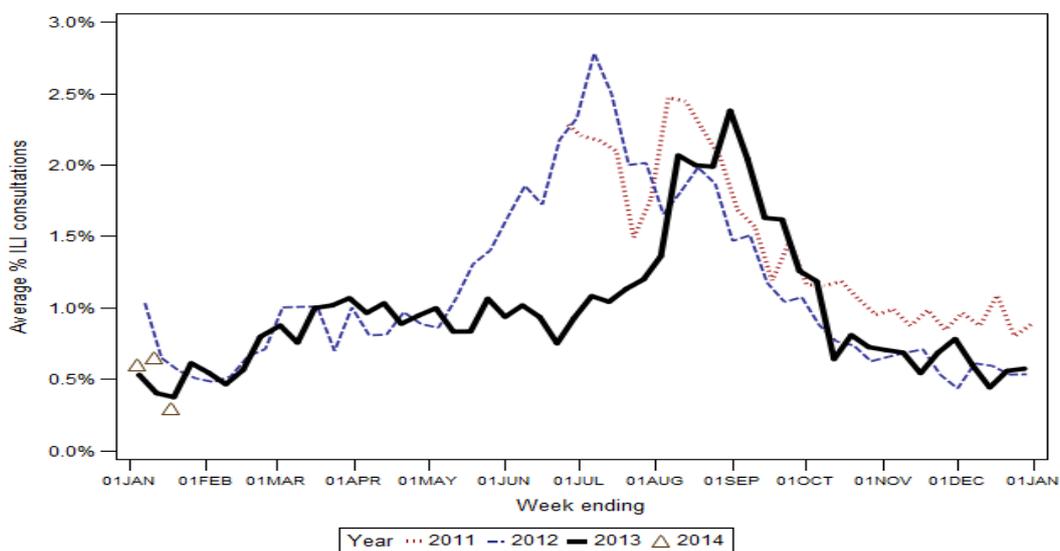
eGPS is a primary care influenza surveillance system involving sentinel general practices within three NSW Local Health Districts (LHD): Northern Sydney (NS), South Eastern Sydney (SES) and Illawarra Shoalhaven (IS). The system monitors patient consultations for influenza-like illness (ILI) as an indicator 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 2013, weekly reports were received on average from 19 sentinel practices.

- The highest weekly ILI activity reported by GP's was during the month of September where the average rate for patient consultations with ILI was 2.3% (range 0.1 – 4.6%). This is lower than and later than 2012 (Figure 4).

Figure 4. Average rate of influenza-like-presentations to sentinel general practices, by week of consultation, 2011-2013.



Note: The number of practices reporting may vary from week to week. Data available from Week 29, 2011.

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.

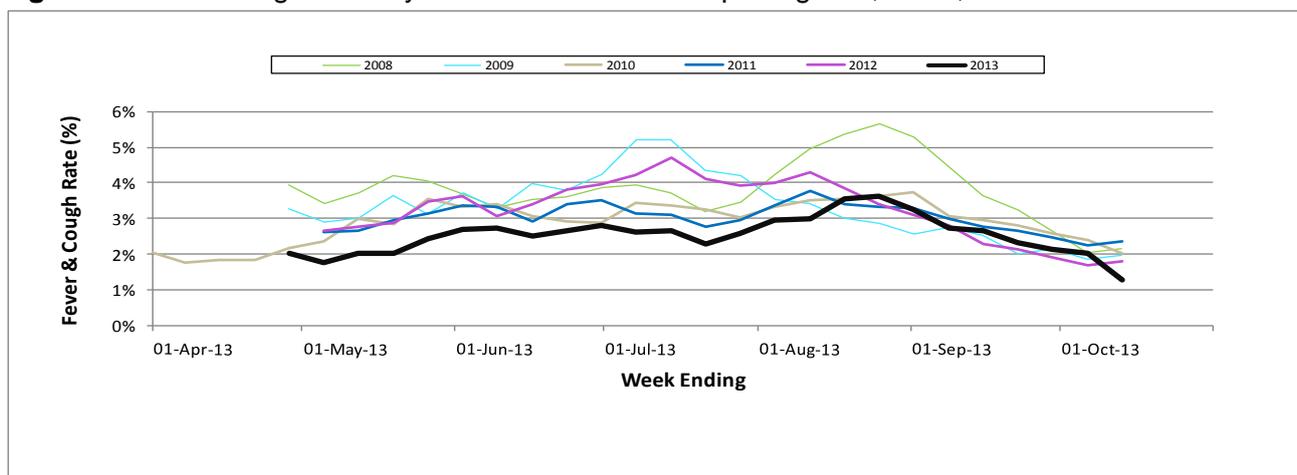
- For 2013, weekly reports were received on average from 25 GP practices
- There was no clearly defined reporting peak; however NSW data suggests that most presentations to GP for ILI occurred during the month of August. For further information please see the [ASPREN](#) website.

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 2013, the highest weekly ILI activity reported from people was the last week of August where FluTracking received reports for 4899 people in NSW. The number of respondents reporting fever and cough for this week was 3.6%, this was within the usual range for this time of year (Figure 5). Overall, 2.2% of respondents reported fever, cough and absence from normal duties.

Figure 5: FluTracking – Weekly influenza like illness reporting rate, NSW, 2008 – 2013.



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

4. Laboratory testing summary for influenza

In December 2013:

- 3,289 tests for respiratory viruses were performed at sentinel NSW laboratories ([Table 1](#))
- 80 specimens tested positive for influenza A – 27 of these tested positive for A(H3N2), 14 tested positive for influenza A(pH1N1) and 39 were not typed further ([Table 1](#), Figure 4).
- 38 cases of influenza B were reported ([Table 1](#), Figure 4).

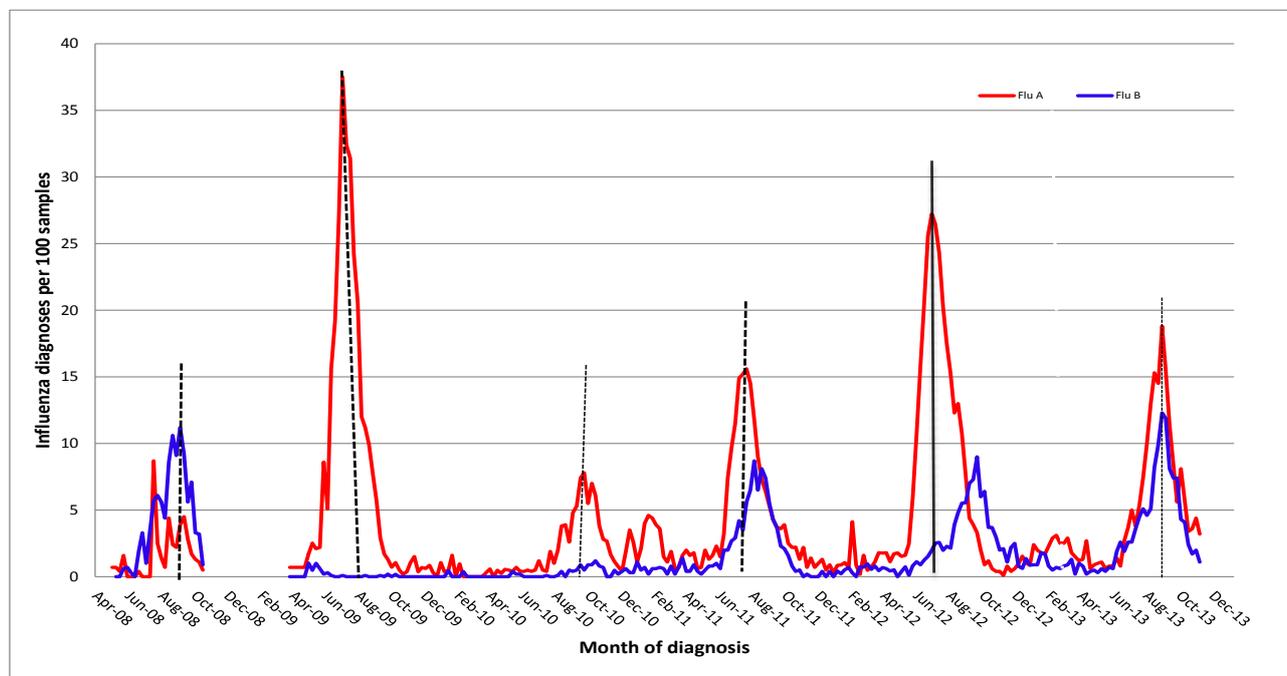
In December 2013, laboratory testing suggested influenza activity continued to decline and was circulating at low levels. A higher than usual number of case with influenza A(pH1N1) occurred, with the majority of these believed to have been associated with overseas travel. Other respiratory viruses circulated at higher levels than influenza, including rhinovirus, parainfluenza and adenovirus.

From 1 January to 29 December 2013:

- 58,919 tests for respiratory viruses were performed at sentinel NSW public hospital and private laboratories ([Table 1](#)).
- 3,716 tests were positive for influenza A ([Table 1](#), Figure 4).
 - 1,891 were positive for pH1N1 and, of these, 45 were characterised as A/California/7/2009-like.
 - 440 were positive for H3N2 and, of these, 17 were characterised as A/Victoria/361/2011-like.
 - the remaining 1,385 influenza A samples were not typed further.
- 2,404 tests were positive for influenza B ([Table 1](#), Figure 4).
 - 35 influenza B samples were sent for further characterisation, with 32 identified as B/Massachusetts/2/2012-like and 3 identified as B/Brisbane/60/2008-like.
- Laboratories reported that at least 119 of the patients with confirmed influenza were known to have been admitted to an intensive care units(ICU)
- Influenza was confirmed as the cause of 12 respiratory outbreaks in institutions reported across NSW affecting aged care (9), residential intellectual disability care (2), and correctional (1) facilities.

The laboratory data suggests that activity for both influenza A and B began to rise in the middle of June and peaked during the last week of August (Figure 4). The peak in influenza B activity was higher than in recent years and was also unusual as historically the peak in influenza B activity tends to come after the peak in influenza A activity. At the end of August, 31 percent of all submitted respiratory samples were positive for either influenza A or B (Figure 4).

Figure 4: Percent of laboratory tests positive for influenza A and influenza B, 1 January 2006 – 29 December 2013, New South Wales.



Notes

- Data is provided by laboratories on a weekly basis.
- Excludes point of care tests.
- Participating sentinel laboratories include the following: South Eastern Area Laboratory Services, Institute of Clinical Pathology and Medical Research, The Children’s Hospital at Westmead, Sydney South West Pathology Service, Pacific Laboratory Medicine Service, Royal Prince Alfred Hospital, Hunter Area Pathology Service, Nepean Hospital Pathology, Douglas Hanley Moir Pathology, VDRLab, Laverty Pathology, SydPath (St Vincent’s) Pathology, Medlab, and Laverty.

5. Summary of APSU surveillance of influenza with severe complications in NSW 1 July to 30 September 2013

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 affiliated with the Division of Paediatrics and Child Health, Royal Australasian College of Physicians (RACP) and the Discipline of Paediatrics and Child Health, Sydney Medical School, the University of Sydney. It 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 detail on APSU methodology please see the APSU website: www.apsu.org.au).

Annual reporting of severe complications from influenza has been reported by the APSU for the period July to September since 2009. For this reporting period in 2013 there were seven cases of influenza with severe complications in children less than 15 years of age in NSW reported to the APSU.

- Five cases involved influenza subtype A (these were the only cases of subtype A reported to APSU in Australia), two cases involved influenza subtype B. Four cases were in males. The median age was 1.9 years (range 0.03-9.2 years).
- Two cases had not been vaccinated for influenza and the influenza vaccination status of the other five cases was unknown.
- Five of the seven cases were admitted to hospital between 31 July and 5 August.
- Three of the cases had an underlying chronic medical condition.

The most common complications were pneumonia with oxygen requirement (four cases), and seizures (four cases).

There were two fatal cases; nine year old twins with profound disabilities. The five other cases were discharged after hospital stays from 2 to 8 days.

6. Influenza Complications Alert Network (FluCAN) - Reporting period 5 April to 31 October, 2013

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 Department of Health. Data provided by Monash University, Melbourne.

In NSW, the FluCAN sentinel hospital system monitored influenza hospitalisations at two sites: John Hunter Hospital and Westmead Hospital.

For the reporting period, FluCAN reported 125 hospital admissions with confirmed influenza.

- 99 (79%) were admitted to either a general or respiratory ward, 14 (14%) were admitted directly to a high dependency unit (HDU), and 12 (10%) were admitted to an intensive care unit (ICU).
- 96 (77%) of cases were influenza A positive: 79 (63%) had influenza A(pH1N1), 17 (14%) were negative for influenza A(pH1N1) and were presumed to be H3N2.
- 29 (23%) of cases were influenza B.
- 21 of the 26 cases (81%) admitted to HDU or ICU were positive for influenza A(pH1N1).
- 50 (40%) of cases were people aged 15 to 49 years, 39 (31%) were aged >65 years and only one child was admitted.
- 15 (12%) of cases were pregnant women.

7. 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 29 December:

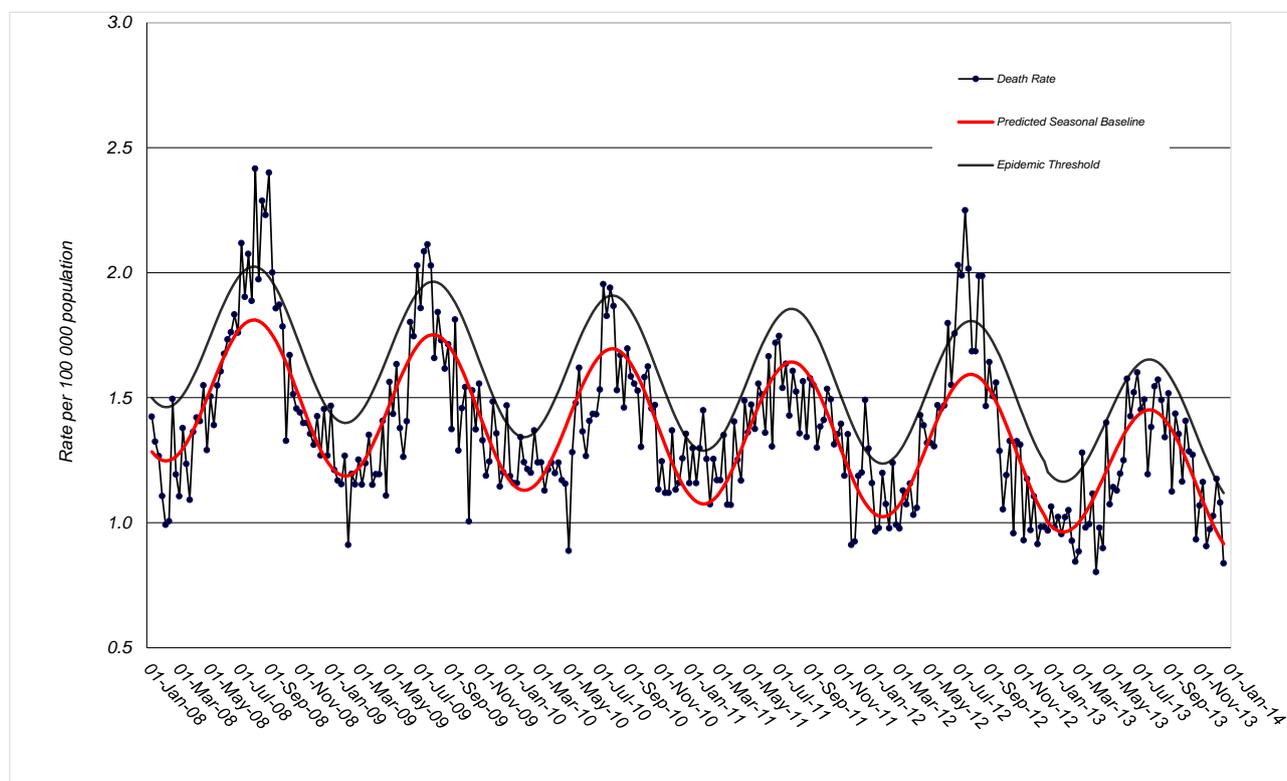
There were 0.83 pneumonia or influenza deaths per 100,000 NSW population, which is below the epidemic threshold of 1.11 per 100,000 population (Figure 5).

From 1 January to 29 December 2013:

For 2013, out of 49,560 deaths there were 35 death certificates mentioning influenza, and 4,494 mentioning pneumonia. Of the deaths mentioning influenza, the majority were related to persons aged 50 years and over. There were, however, eight deaths reported in people aged 25 to 44 years. There were no deaths recorded in children.

Death rates for both influenza and pneumonia as a proportion of the NSW population were lower in 2013 than in 2012, and did not exceed the forecast epidemic threshold (Figure 5). This likely reflects the higher proportion of influenza A(pH1N1) circulating in the community this year, for which there are higher levels of acquired immune protection in older age groups. People in older age groups were more susceptible to the influenza A(H3N2) strains which predominated in 2012.

Figure 5: Rate of deaths classified as influenza and pneumonia (by NSW Registered Death Certificates) per 100,000 NSW population, 2007-2013



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.

8. Immunisation reporting from the NSW Population Health Survey 2011-2013

The New South Wales Population Health Survey (NSWPHS) is an ongoing telephone survey of state residents that is one of the main mechanisms through which NSW Health monitors population health and reports on performance indicators. Its objectives are to:

- monitor changes over time in self-reported health behaviours, health status, health service use, satisfaction with health services, and other factors that influence health;
- support the planning, implementation, and evaluation of health services;
- collect health information that is not available from other sources;
- respond quickly to emerging needs for health information
- promote research.

For 2013, results from the NSWPHS questions related to influenza vaccination are presented in [Table 2](#). While the influenza vaccine uptake estimates generally have wide confidence intervals, the survey data indicated that influenza vaccine uptake in 2013:

- remained steady overall at approximately 31 percent of the population
- continued to be highest in the 65 years and older age group (approximately 70 percent)
- trended slightly higher in the 45-64 year age group compared to 2012
- continued the trend lower in the 0 to 15 years age group
- trended slightly lower in the 16-44 year age group overall and for women alone, despite recent efforts to promote the national recommendation for pregnant women to be vaccinated.

9. National and International Influenza Surveillance

National Influenza Surveillance

Nationally the 2013 influenza season appears to have peaked at the end of August. Overall influenza activity has been relatively low compared to 2011 and 2012.

- Over the 2012-13 inter-seasonal period, higher than usual numbers of influenza notifications were reported from most jurisdictions. The seasonal increase in influenza notifications commenced in early July and persisted over a shorter period than 2011 and 2012. The season peak of weekly notifications was similar to 2011 and occurred at the end of August.

- Influenza activity peaked at the end of August in the majority of jurisdictions. Tasmania and the Northern Territory experienced a late peak while Western Australia reported extended increased activity from mid-August through September.
- Nationally influenza A was the predominant influenza virus type. Influenza A(pH1N1) re-emerged this season and represented over 15% of overall notifications, compared to <1% of notifications in 2012. Additionally, the proportion of influenza B this season has been higher than in recent years.
- Across jurisdictions, the distribution of influenza types and subtypes has been variable. In Victoria there was a predominance of influenza type B throughout the season, with all other jurisdictions reporting mostly influenza A. In Western Australia, influenza A(H3N2) was the predominant subtype, whereas New South Wales and other eastern jurisdictions reported mostly A(pH1N1). Towards the end of the season while the proportion of influenza B remained stable nationally, increases were observed in New South Wales, South Australia and Queensland and the proportion of A(pH1N1) increased in Western Australia.
- The rate of influenza associated hospitalisations has started to decline over the past fortnight. Both the 2012 and 2013 influenza seasons saw around 12% of influenza cases admitted directly to ICU and a high proportion of cases had known medical co-morbidities reported. In Australia it has been estimated that there have been over 4,500 influenza-associated hospitalisations since April 2013. The age distribution of hospital admissions shows a peak in the 0-9 year age group as is typical of seasons with high levels of influenza B circulating.

Avian influenza A(H7N9) in China

In 2013, China reported 153 influenza A(H7N9) cases, 47 of them fatal. Most of the cases were reported earlier in the year. After a summer lull the country reported an additional 8 cases from the end of August. Only four other cases have been reported outside the mainland, two in Taiwan in a man who had visited the outbreak area for work and a visitor and two in Hong Kong, both visitors.

10. Recommended composition of 2014 Australian influenza vaccines

A World Health Organization (WHO) consultation held in September recommended that trivalent vaccines for use in the 2014 influenza season (southern hemisphere winter) contain the following:

- an A/California/7/2009 (H1N1)pdm09-like virus *;
- an A/Texas/50/2012 (H3N2)-like virus **;
- a B/Massachusetts/2/2012-like virus.

* A/Christchurch/16/2010 is an A/California/7/2009-like virus.

** A/Texas/50/2012 is an A(H3N2) virus with antigenic properties similar to the majority of recently circulating cell-propagated A(H3N2) viruses including A/Victoria/361/2011.

It is also recommended that quadrivalent vaccines containing two influenza B viruses contain the above three viruses and a B/Brisbane/60/2008-like virus.

The full report of the WHO consultation is available at :

www.who.int/influenza/vaccines/virus/recommendations/2014_south/en/index.html

The [Australian Influenza Vaccine Committee](#) (AIVC) met on 10 October 2013 to recommend influenza viruses to be used in the composition of the influenza vaccines for 2014. The committee recommended that the Therapeutic Goods Administration (TGA) should adopt the September WHO recommendations. The trivalent influenza vaccine components for the Australian 2014 influenza season should contain the following:

- A (H1N1): an A/California/7/2009 (H1N1) - like virus, 15 µg HA per dose
- A (H3N2): an A/Texas/50/2012 (H3N2) - like virus, 15 µg HA per dose
- B: a B/Massachusetts/2/2012 - like virus, 15 µg HA per dose

Quadrivalent vaccines should contain viruses listed above, plus the additional B virus:

- B/Brisbane/60/2008-like virus, 15 µg HA per dose.

The TGA has accepted the recommendations of the AIVC.

For the latest information on national influenza activity please see the Australian Influenza Surveillance Reports at the following website:

<http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-ozflu-2013.htm>

For the latest information on international influenza activity please see the World Health Organization Influenza Updates at the following website:

<http://www.who.int/csr/disease/influenza/en/index.html>

Table 1: Summary of testing for respiratory viruses and influenza at NSW public hospital laboratories, 1 January to 29 December 2013.

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	(%)						
01/02/2013*	2199	44	(2.0%)	13	(29.5%)	14	(31.8%)	17	(38.6%)	26	(1.2%)	68	87	81	328	37	59
01/03/2013	2263	60	(2.7%)	17	(28.3%)	20	(33.3%)	23	(38.3%)	15	(0.7%)	55	41	119	452	29	31
29/03/2013	2595	47	(1.8%)	9	(19.1%)	12	(25.5%)	26	(55.3%)	21	(0.8%)	82	59	333	488	53	33
26/04/2013	3165	39	(1.2%)	13	(33.3%)	11	(28.2%)	15	(38.5%)	10	(0.3%)	92	188	599	586	61	54
02/06/2013*	4885	38	(0.8%)	14	(36.8%)	12	(31.6%)	12	(31.6%)	23	(0.5%)	116	115	742	812	41	62
30/06/2013	4855	106	(2.2%)	21	(19.8%)	45	(42.5%)	40	(37.7%)	108	(2.2%)	109	105	663	685	44	94
28/07/2013	6051	397	(6.6%)	30	(7.6%)	151	(38.0%)	216	(54.4%)	240	(4.0%)	164	131	714	672	49	206
01/09/2013*	10305	1505	(14.6%)	94	(6.2%)	917	(60.9%)	494	(32.8%)	873	(8.5%)	244	218	458	813	30	349
29/09/2013	8994	969	(10.8%)	67	(6.9%)	555	(57.3%)	347	(35.8%)	804	(8.9%)	219	224	290	589	16	191
03/11/2013*	6301	326	(5.2%)	92	(28.2%)	124	(38.0%)	110	(33.7%)	194	(3.1%)	212	300	116	607	13	130
01/12/2013	4017	105	(2.6%)	43	(41.0%)	16	(15.2%)	46	(43.8%)	52	(1.3%)	137	148	71	509	12	39
29/12/2013	3289	80	(2.4%)	27	(33.8%)	14	(17.5%)	39	(48.8%)	38	(1.2%)	106	133	74	400	6	54
Week ending																	
08/12/2013	961	21	(2.2%)	10	(47.6%)	6	(28.6%)	5	(23.8%)	12	(1.2%)	31	42	19	116	2	18
13/12/2013	1033	31	(3.0%)	10	(32.3%)	5	(16.1%)	16	(51.6%)	17	(1.6%)	34	36	25	127	3	8
22/12/2013	823	22	(2.7%)	7	(31.8%)	3	(13.6%)	12	(54.5%)	7	(0.9%)	19	31	18	85	1	22
29/12/2013	472	6	(1.3%)	0	(0.0%)	0	(0.0%)	6	(100.0%)	2	(0.4%)	22	24	12	72	0	6

* Equals a five week period ** Subset of influenza A cases

Notes

- Data is provided by laboratories on a weekly basis.
- Excludes point of care tests.
- Influenza laboratory diagnoses using virology are reported by 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 & Pathology West, Nepean, Douglas Hanley Moir Pathology, VDRLab, Lavery Pathology, SydPath (St Vincent's) Pathology, and Medlab.

Table 2: NSW Population Health Survey – Respondents reporting vaccination against influenza in the past 12 months, by age, survey month and year, all persons, and females 16 – 44 years, NSW, Jul 2011 – Sep 2013.

Age (years)	2011	2011	2011	2012	2012	2012	2013	2013	2013
	Apr-May	Jun-Jul	Aug-Sep	Apr-May	Jun-Jul	Aug-Sep	Apr-May	Jun-Jul	Aug-Sep
	N=2911	N=3032	N=2800	N=1047	N=1815	N=2271	N=1804	N=1356	N=1611
	% (95% CI)								
0 - 15	23 (19 - 27)	17 (14 - 21)	15 (12 - 19)	10 (5 - 16)	13 (8 - 17)	10 (7 - 14)	7 (3 - 10)	8 (4 - 12)	9 (5 - 13)
16 - 44, all	25 (22 - 29)	28 (24 - 31)	25 (22 - 29)	21 (15 - 27)	21 (16 - 25)	22 (18 - 26)	16 (11 - 20)	22 (17 - 28)	19 (14 - 24)
16 - 44, female	25 (20 - 29)	29 (24 - 33)	23 (19 - 28)	24 (16 - 32)	19 (13 - 25)	26 (20 - 31)	16 (11 - 22)	21 (14 - 28)	19 (12 - 25)
45 - 64	38 (35 - 41)	35 (32 - 38)	37 (34 - 40)	34 (29 - 39)	33 (30 - 37)	36 (32 - 39)	31 (27 - 34)	37 (32 - 41)	41 (37 - 45)
65 & over	72 (69 - 75)	76 (73 - 79)	72 (69 - 75)	67 (62 - 72)	72 (69 - 76)	72 (69 - 76)	64 (60 - 67)	72 (68 - 76)	73 (70 - 77)
Total*	35 (33 - 37)	34 (32 - 37)	33 (31 - 35)	29 (25 - 33)	30 (27 - 33)	31 (28 - 33)	25 (22 - 27)	31 (27 - 34)	31 (28 - 33)

*Age-standardised to the NSW population in each year.

Source: *New South Wales Population Health Survey. Centre for Epidemiology and Evidence. NSW Ministry of Health*

Notes

- For the complete analysis, estimates were based on 27930 interviews conducted from July 2009 to September 2013 for April through to September.
- Estimates do not include respondents with 'Refused' response, 'Don't know' response or were 'Not asked' (1.37 % combined). Estimates for the current year do not include interviews conducted in languages other than English.
- The question used to define the indicator was 'Were you vaccinated or immunised against flu in the last 12 months?'. From 2013, an additional question determined if the vaccination was this year or last year. Therefore, some vaccinations reported prior to 2013 may have occurred in the year previous to the interview.
- Estimates in the 'Total' category were age-standardised to the NSW population.
- From February 2011, the survey sample was chosen by selecting persons from households located in Local Health Districts. Previously, sampling was from Area Health Service regions.
- For further information on the NSW Population Health Survey and its methods see: <http://www.health.nsw.gov.au/publichealth/surveys/phs.asp> and http://www.health.nsw.gov.au/resources/publichealth/surveys/health_survey_method.asp.