NSW Health Influenza Surveillance Report

Week 37:11 to 17 September, 2017

Summary:

- **Influenza activity continues to decline but overall activity remains high.**
- **Influenza B strains were the predominant influenza type.**

In this reporting week:

- Hospital surveillance – emergency department presentations for respiratory illness, including influenza-like illness (ILI), decreased further. Overall activity remained high.
- Laboratory surveillance – the total number of influenza isolations decreased further, and the influenza-positive test rate was lower at 37.0%. The number and proportion of influenza A strain isolations fell again while influenza B strain isolations were steady.
- Community surveillance – influenza notifications decreased overall. ASPREN and FluTracking surveillance indicated further declines in ILI activity. The frail elderly continue to be at increased risk with a further 32 outbreaks reported in residential aged care facilities.
- Deaths with pneumonia or influenza reported on the death certificate – the NSW Registry of Births, Deaths, and Marriages has recorded 182 deaths in association with influenza in 2017 (up to 18 August). The rate of deaths classified as "pneumonia and influenza" was increased overall.
- National and international influenza surveillance – influenza activity is past the peak in most Australian jurisdictions but activity remains high overall. High influenza activity is being reported in temperate regions of the southern hemisphere. Worldwide, influenza A(H3N2) viruses are predominating.
- Recommended composition of 2017 influenza vaccines – the 2017 Australian influenza vaccines cover two A and two B strains, including one A strain change from the 2016 influenza vaccines.

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

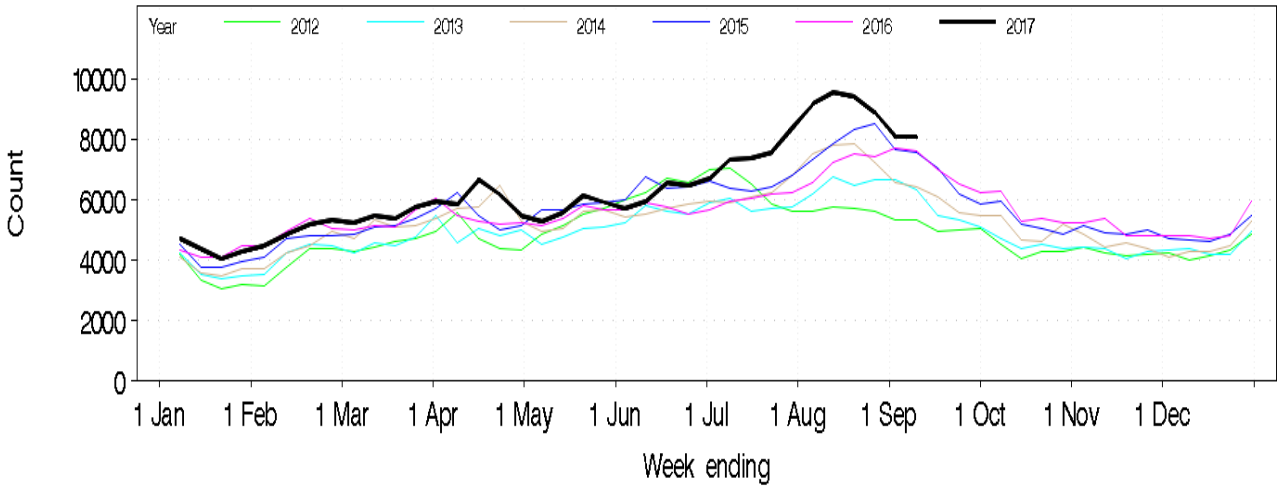
NSW emergency department (ED) presentations for influenza-like illness (ILI) and other respiratory illnesses

Source: PHREDSS [1]

For the week ending 17 September 2017:

- All respiratory illness, fever and unspecified infections presentations decreased slightly but remained above the usual seasonal range (Figure 1 and Table 1).
- ILI presentations [2] decreased further this week but levels remained high for most age groups and many NSW local health districts (LHDs) (Figure 2 and Table 1).
- ILI presentations resulting in admission also decreased but remained above the usual range (Figure 3 and Table 1).
- As of 17 September 2017, the daily index of increase for ILI presentations across NSW was lower again at 24.7. The index peaked on 11 August (98.4) after first crossing the ED seasonal threshold of 15.0 on 23 June 2017.
- The proportion of ILI presentations to all ED presentations was 10.1 per 1000 presentations, lower than the previous week (12.7 per 1000).
- ED presentations for pneumonia and admissions [3] decreased. Both were within the usual range for this time of year (Table 1).
- Pneumonia and ILI presentations requiring admission to critical care decreased and were just above usual range for this time of year (Figure 4 and Table 1).
- Bronchiolitis presentations increased but remained within the usual range for this time of year (Table 1).

Figure 1: Total weekly counts of ED visits for any respiratory illness, fever and unspecified infections, all ages, from 1 January – 10 September, 2017 (black line), compared with each of the 5 previous years (coloured lines).



[1] NSW Health Public Health Rapid, Emergency Disease and Syndromic Surveillance system, CEE, NSW Ministry of Health. Comparisons are made with data for the preceding 5 years. Recent counts are subject to change. Data from 60 NSW emergency departments are included. The coverage of rural EDs is lower than metropolitan EDs. Data shown represent 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 visits for influenza-like illness, all ages, from 1 January – 17 September, 2017 (black line), compared with each of the 5 previous years (coloured lines).

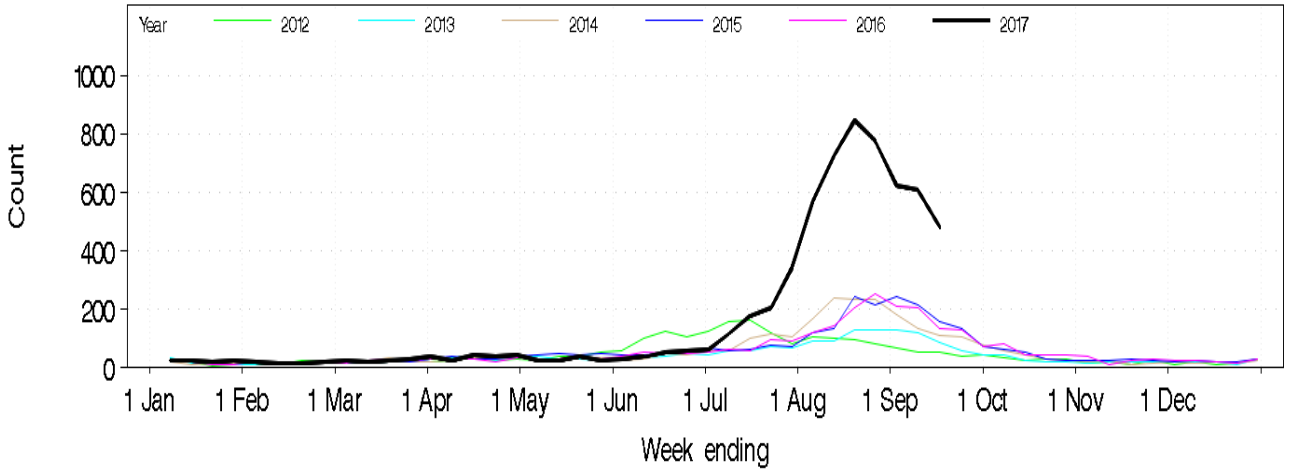


Figure 3: Total weekly counts of ED presentations for influenza-like-illness that were admitted, all ages, from 1 January – 17 September 2017 (black line), compared with each of the 5 previous years (coloured lines).

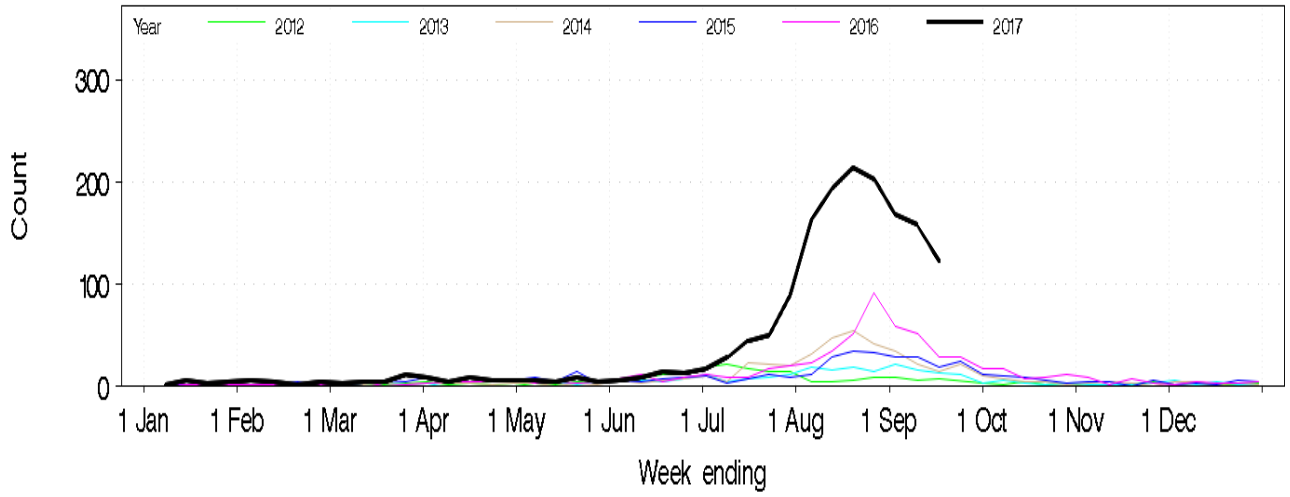


Figure 4: Total weekly counts of ED presentations for influenza-like illness and pneumonia, that were admitted to a critical care ward all ages, from 1 January – 17 September, 2017 (black line), compared with each of the 5 previous years (coloured lines).

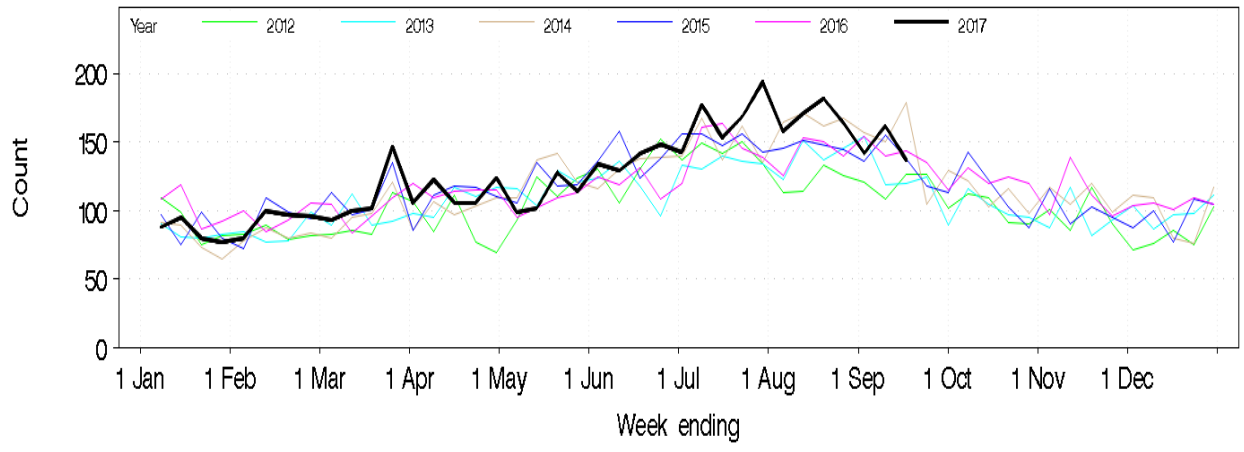


Table 1: Weekly ED and Ambulance Respiratory Activity Summary for the week ending 17 September 2017. Includes data from 60 NSW EDs and the NSW Ambulance Division. [4]

Data source	Diagnosis or problem category	Trend since last week	Comparison with usual range*	Significantly elevated age groups	Significantly elevated locations (LHDs)	Significant elevated severity indicators**	Comment
ED presentations 60 NSW hospitals	Influenza-like illness (ILI)	Decreased (480)	**Above (52-159)**	**65+ years (155) 35-64 years (157) 5-16 years (47) 17-34 years (91) 0-4 years (30)**	**Hunter New England (107), Central Coast (34), Murrumbidgee (36) South Eastern Sydney (57), Illawarra Shoalhaven (40), Mid North Coast (23), Western NSW (27), Northern Sydney (31), Northern NSW (25),Western Sydney (38).**	**Ambulance arrival (122)**	Daily index of increase = 24.7
	ILI admissions	Decreased (123)	**Above (7-29)**	**65+ years (79) 35-64 years (27) 0-4 years (7)**	**Central Coast (12), Hunter New England (30), South Eastern Sydney (22)**	**Ambulance arrival (65)**	
	Pneumonia	Decreased (612)	Within (414-655)				
	Pneumonia admissions	Decreased (444)	Within (302-461)				
	Pneumonia and ILI critical care admissions	Decreased (47)	Above (21-45)				
	Asthma	Decreased (381)	Below (390-497)				
	Bronchiolitis	Increased (204)	Within (173-280)				
	All respiratory illness, fever and unspecified infections	Decreased (7,549)	**Above (4,938-7,016)**	**65+ years (2,013) 35-64 years (1,457) 5-16 years (955)**	**Mid North Coast (399), Central Coast (482), Hunter New England (1,104), Murrumbidgee (369), Northern NSW (357), South Western Sydney (930), Nepean Blue Mountains (324)**	**Admitted (2,588), ambulance arrival (1,813)**	

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.

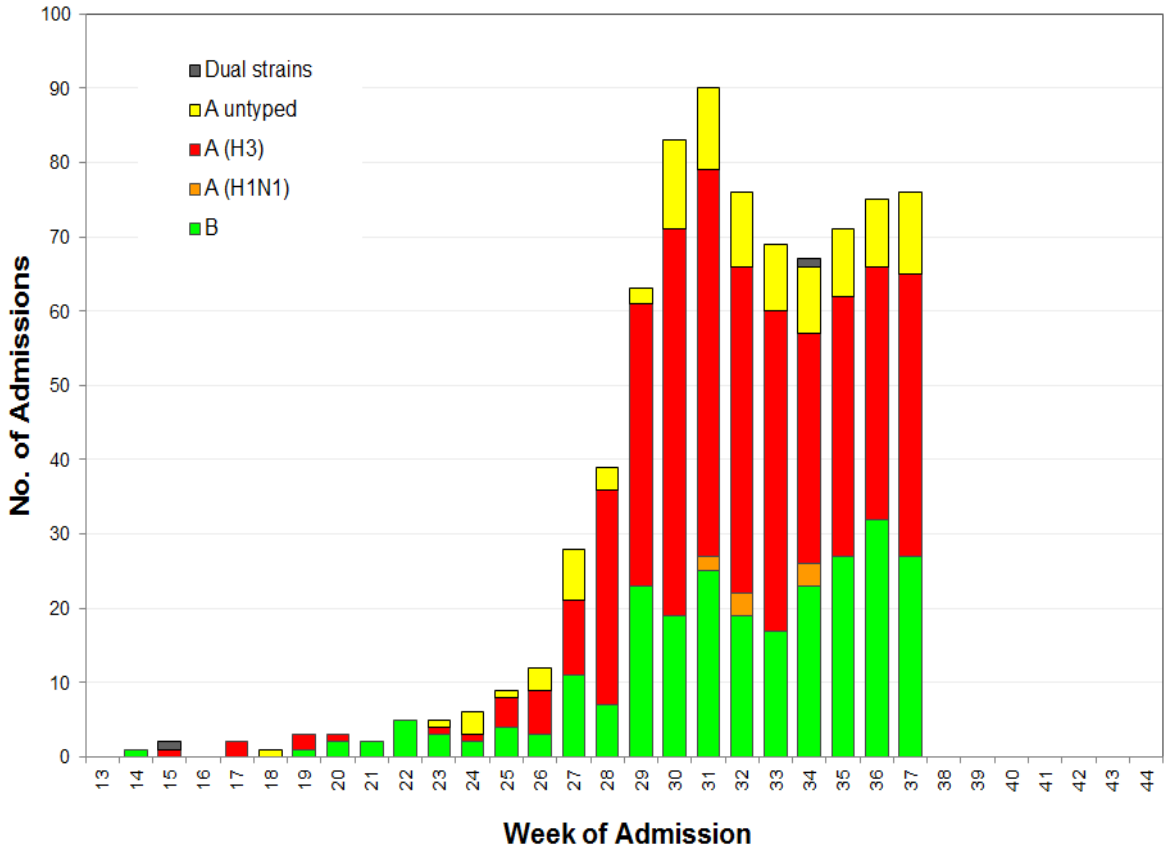
During week 37 there were 76 influenza admissions in NSW sentinel hospitals (Figure 5). Of these, 49 were due to influenza A and 27 were due to influenza B. A total of 38 of the influenza A cases had sub-typing information and all were believed to be A(H3N2) strains.

Since 1 April 2017, there have been 794 hospital admissions reported for influenza; 534 due to influenza A, 253 due to influenza B, two with dual infections and five where type was not recorded (Figure 5).

Of these admissions, 216 were paediatric cases (<16 years of age) and 578 were in adults. Of the 794 cases, 79 cases (10%) have been admitted to a critical care ward.

[4] **Notes. Key for trend since last week:** Non-bold and green=decreased or steady; Non-bold and orange=increased **Key for comparison with usual range:** Non-bold and green =usual range; Non-bold and orange=above usual range, but not significantly above five-year mean; **Bold** and yellow=within usual range, but significantly above five-year mean; **Bold** and red = above the usual range and significantly above five-year mean (ED). Counts are statistically significant (shown in **bold**) if they are at least five standard deviations above the five-year mean for ED presentations. The 'daily index of increase' is statistically significant above a threshold of 15. LHD = Local Health District.
* The usual range is the range of weekly counts for the same week in the previous five years for ED presentations. Note that comparisons are not adjusted for the start of the season. Cells with small counts are not reported.
** Severity indicators include: Admission to a ward or critical care service; Triage category 1; Ambulance arrival and Death in ED.

Figure 5: FluCAN – Number of confirmed influenza hospital admissions in NSW, 1 April 2017 to 17 September 2017.*



Notes: * All data are preliminary and may change as more information is received. The Influenza A untyped category indicates no strain sub-typing has been performed. The Influenza A (H3) category includes some influenza A results where influenza A (H1N1) has been excluded.

2. Laboratory Surveillance

For the week ending 17 September 2017 the number and proportion of respiratory specimens reported by NSW sentinel laboratories [5] which tested positive for influenza A or influenza B decreased further (Table 2, Figure 6), with a continuation of the decreasing trend in testing for respiratory viruses overall.

Overall, 37.0% of tests for respiratory viruses were positive for influenza, lower than the previous week (Figure 5). The influenza B strain positive percentage was 19.2%, slightly lower to the previous week (19.9%) but higher than for influenza A strains which continue to decline (Table 2, Figures 6 and 7).

Influenza remains the leading respiratory virus reported. All other respiratory viruses are circulating at usual 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. Participating sentinel laboratories: NSW Health Pathology (Hunter New England, North Sydney, Western Sydney, South Eastern Sydney, South West Sydney, The Children's Hospital at Westmead, Australian Clinical Labs, Douglas Hanly Moir Pathology, Laverty Pathology, Medlab, SydPath.

Table 2: Summary of testing for influenza and other respiratory viruses at NSW laboratories by test date, 1 January to 17 September 2017.

Month ending	Total Tests	TEST RESULTS															
		Influenza A								Influenza B		Adeno	Parainf 1, 2 & 3	RSV	Rhino	HMPV **	Entero
		Total		H3N2		H1N1 pdm09		A (Not typed)		Total							
		Total	(%)	Total	(%A)	Total	(%A)	Total	(%A)	Total	(%)						
29/01/2017	10112	497	(4.9%)	53	(10.7%)	4	(0.8%)	440	(88.5%)	93	(0.9%)	375	433	323	1462	236	131
26/02/2017	12273	564	(4.6%)	78	(13.8%)	7	(1.2%)	479	(84.9%)	83	(0.7%)	430	458	719	2772	170	248
02/04/2017*	21262	725	(3.4%)	83	(11.4%)	16	(2.2%)	626	(86.3%)	158	(0.7%)	684	1000	1830	5427	290	530
30/04/2017	18089	373	(2.1%)	63	(16.9%)	15	(4.0%)	295	(79.1%)	135	(0.7%)	588	901	2600	4202	231	468
04/06/2017*	26372	657	(2.5%)	67	(10.2%)	52	(7.9%)	538	(81.9%)	506	(1.9%)	1037	852	3275	6859	299	503
02/07/2017	25688	1407	(5.5%)	104	(7.4%)	73	(5.2%)	1230	(87.4%)	1530	(6.0%)	1058	734	3291	5794	441	490
30/07/2017	46579	9328	(20.0%)	748	(8.0%)	250	(2.7%)	8330	(89.3%)	4516	(9.7%)	1712	926	4059	6011	709	625
03/09/2017*	108262	31677	(29.3%)	1869	(5.9%)	529	(1.7%)	29474	(93.0%)	19670	(18.2%)	2984	1180	4099	8255	1141	681
Week ending																	
10/09/2017	19613	3961	(20.2%)	231	(5.8%)	101	(2.5%)	3629	(91.6%)	3774	(19.2%)	444	264	443	1430	229	81
17/09/2017	19173	3421	(17.8%)	160	(4.7%)	40	(1.2%)	3221	(94.2%)	3680	(19.2%)	416	280	367	1421	262	80

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

Figure 6: Weekly influenza positive test results by type and sub-type reported by NSW sentinel laboratories, 1 January to 17 September 2017.

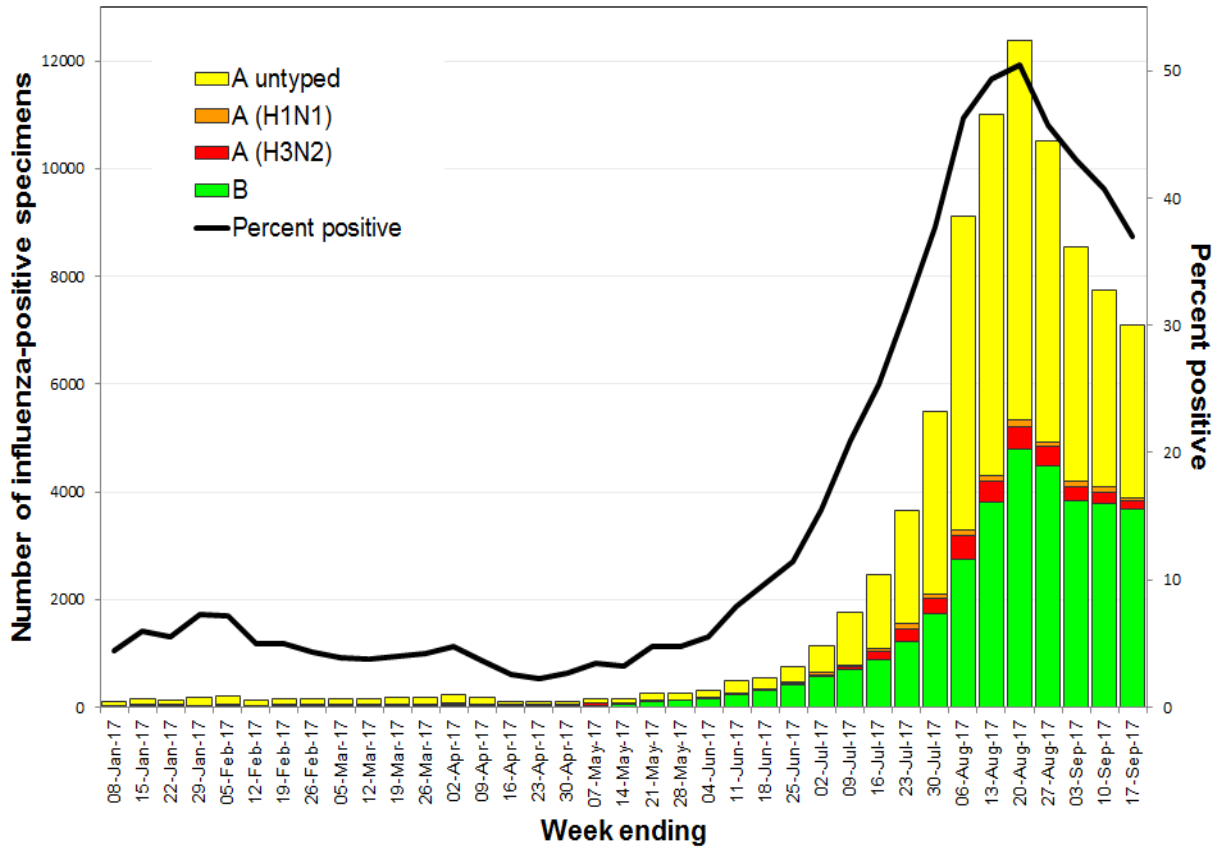
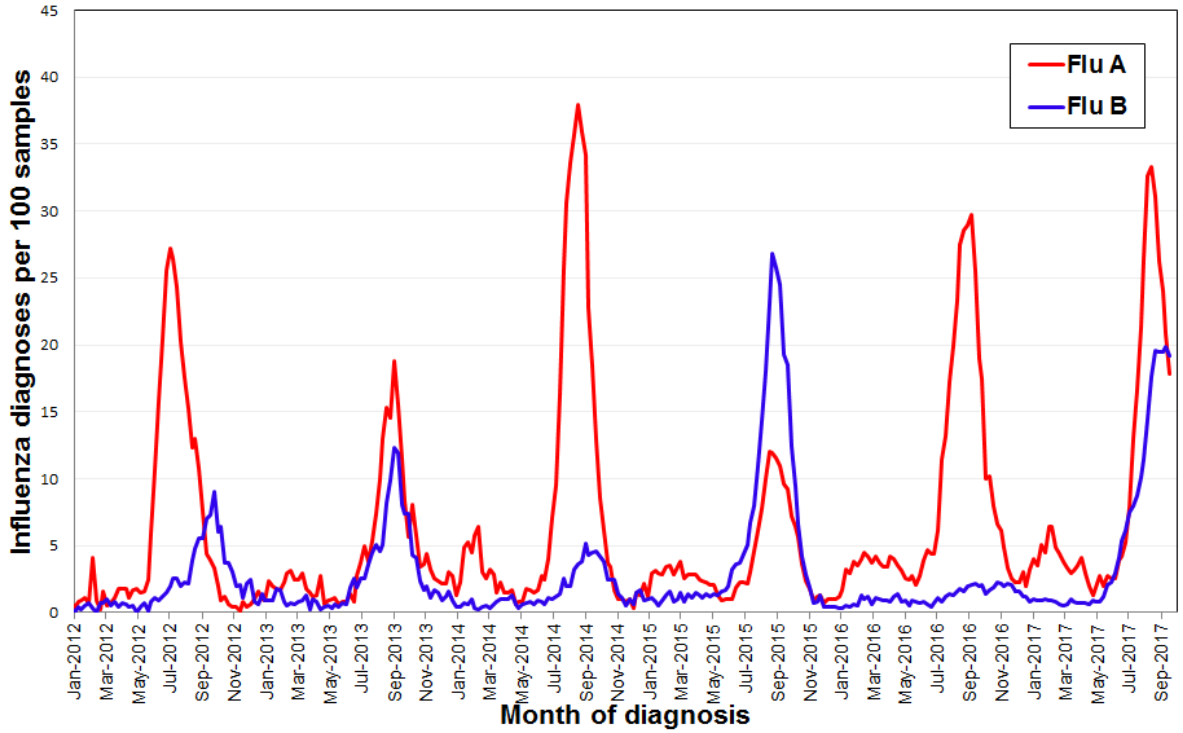


Figure 7: Percentage of laboratory tests positive for influenza A and influenza B by week, 1 January 2012 to 17 September 2017, New South Wales.



3. Community Surveillance

Influenza notifications by Local Health District (LHD)

For week 37 there were 5,960 notifications of influenza confirmed by polymerase chain reaction (PCR) testing, lower than for the previous week (9,039).

Notifications were decreased in most LHDs compared to the previous week, with activity steady for Central Coast LHD (Table 3).

Table 3: Weekly notifications of laboratory-confirmed influenza by NSW Local Health District, by earliest report or create date for week 37, 2017.

Local Health District	Week ending 17 Sep 2017		Week ending 10 Sep 2017	
	Number of notifications	Rate per 100 000 population	Number of notifications	Rate per 100 000 population
Central Coast	402	116.39	398	115.24
Far West	8	23.12	6	19.59
Hunter New England	788	84.75	1140	122.61
Illawarra Shoalhaven	354	86.62	388	94.94
Mid North Coast	126	56.67	173	77.81
Murrumbidgee	228	94.15	339	139.99
Nepean Blue Mountains	334	86.8	511	132.8
Northern NSW	179	58.4	271	88.42
Northern Sydney	862	94.18	1184	129.36
South Eastern Sydney	556	59.92	876	94.41
South Western Sydney	579	58.47	1193	120.48
Southern NSW	129	60.26	158	73.81
Sydney	385	58.8	646	98.66
Western NSW	193	69.06	387	138.48
Western Sydney	837	86.3	1369	141.15

Notes: * All data are preliminary and may change as more notifications are received. Excludes notifications based on serology. For further information follow the influenza link from the diseases data page.

Influenza outbreaks in institutions

There were 38 influenza outbreaks in institutions reported this week, less than the previous week (45). Of these, 32 were in residential aged care facilities and six were in hospitals (Figure 8). A total of 22 outbreaks were due to influenza A, 13 were due to influenza B, two involved both influenza A and B strains, and typing information is pending for one outbreak.

In the year to date there have been 501 laboratory confirmed influenza outbreaks in institutions reported to NSW public health units (Table 4): 385 have been due to influenza A, 83 were due to influenza B, and 33 involved both influenza A and B strains.

In outbreaks affecting aged care facilities, at least 6036 residents were reported to have had ILI symptoms and 567 required hospitalisation. Overall, there have been 242 deaths in residents reported linked to these outbreaks, all of whom were noted to have other significant co-morbidities.

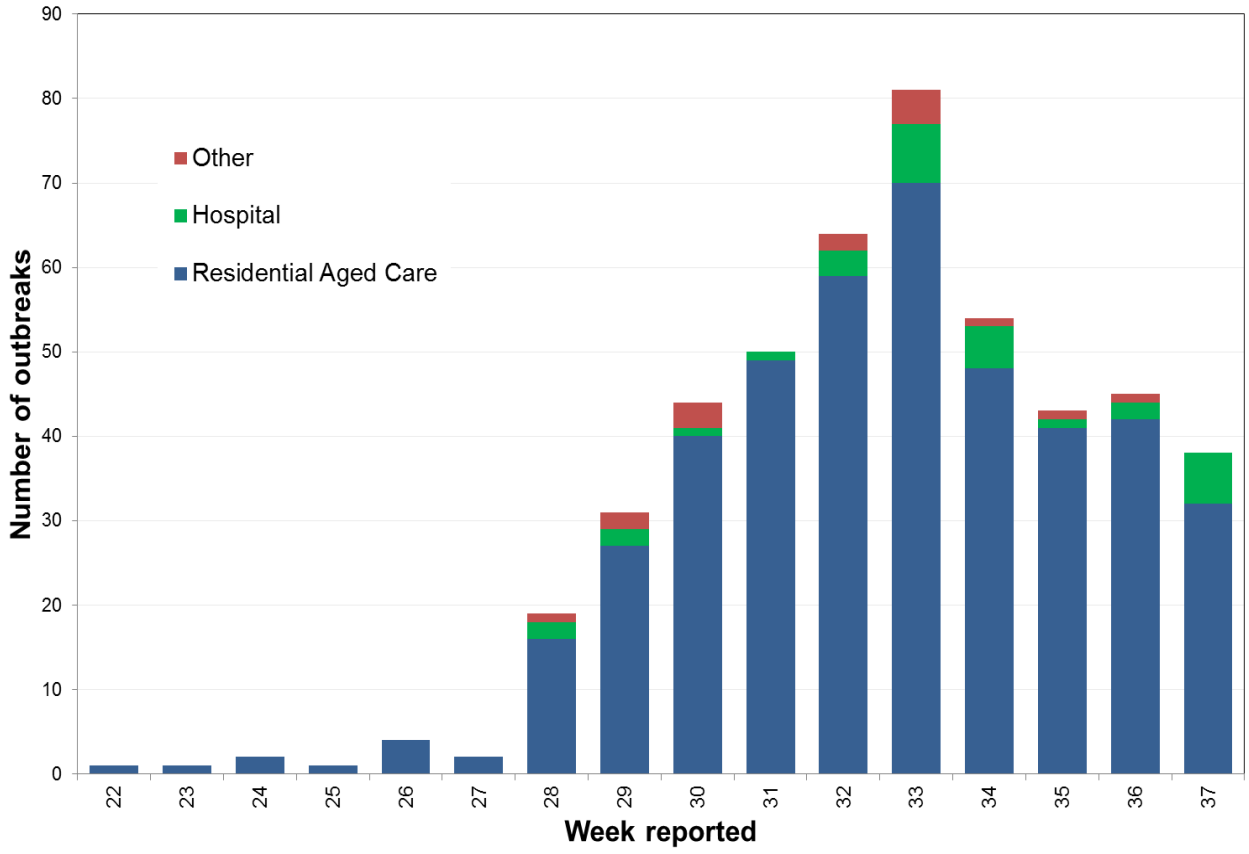
People in older age-groups are at higher risk of infection from the influenza A(H3N2) strain than the influenza A(H1N1) strain. The influenza A(H3N2) strain also predominated in 2012, 2014 and 2016. In 2015, influenza B was the predominant strain, and was also associated with an increase in influenza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

Table 4: Reported influenza outbreaks in NSW institutions, 2010 to 17 September 2017.

Year	2010	2011	2012	2013	2014	2015	2016	2017*
No. of outbreaks	2	4	39	12	120	103	279	501

Notes: * Year to date. All data are preliminary and subject to change.

Figure 8: Reported influenza outbreaks in NSW institutions by week and institution type, week 22 to week 37, 2017.



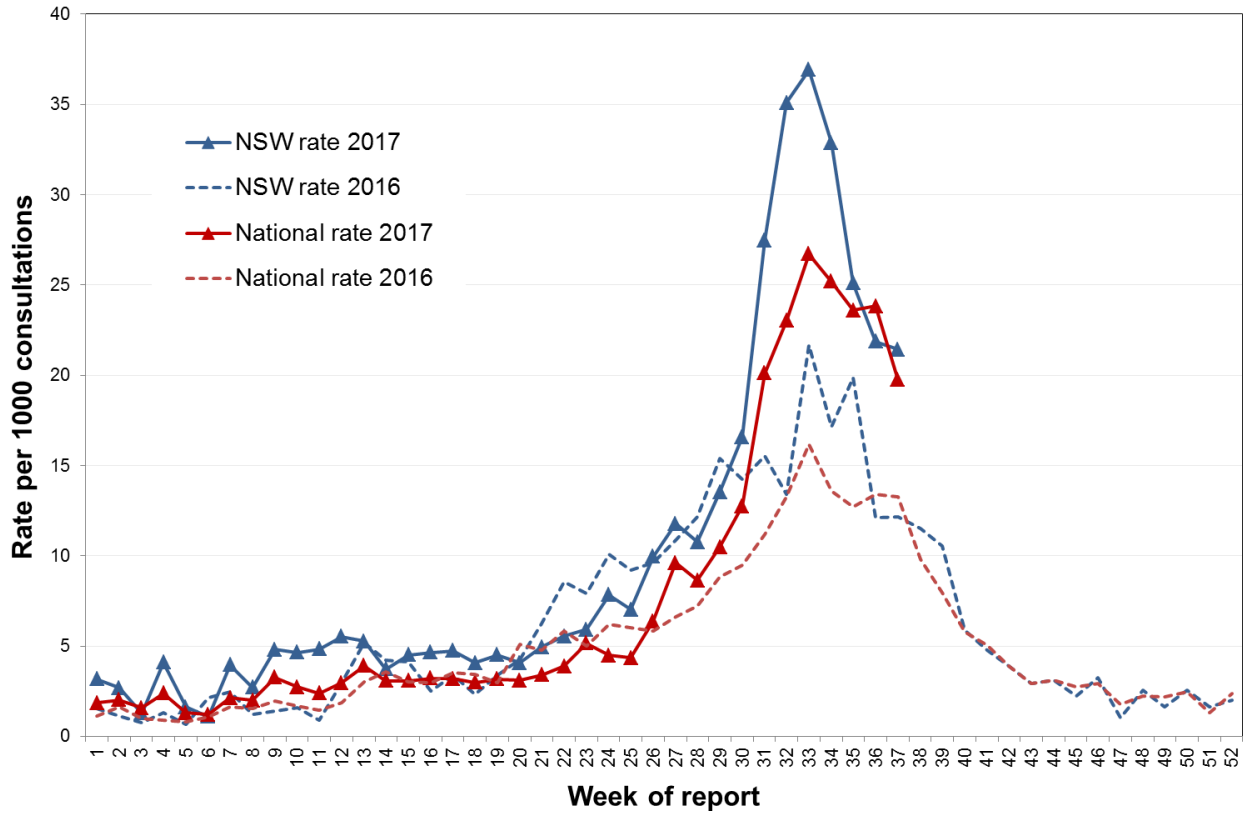
The Australian Sentinel Practices Research Network (ASPREN)

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 37 there were ASPREN reports received from 45 NSW GPs. The reported consultation rate for ILI per 1000 consultations was lower at 21.42 (Figure 9). For further information see the ASPREN website.

Figure 9: ASPREN – NSW and National GP ILI rates per 1000 consultations – 2017 to week 37, compared to 2016.



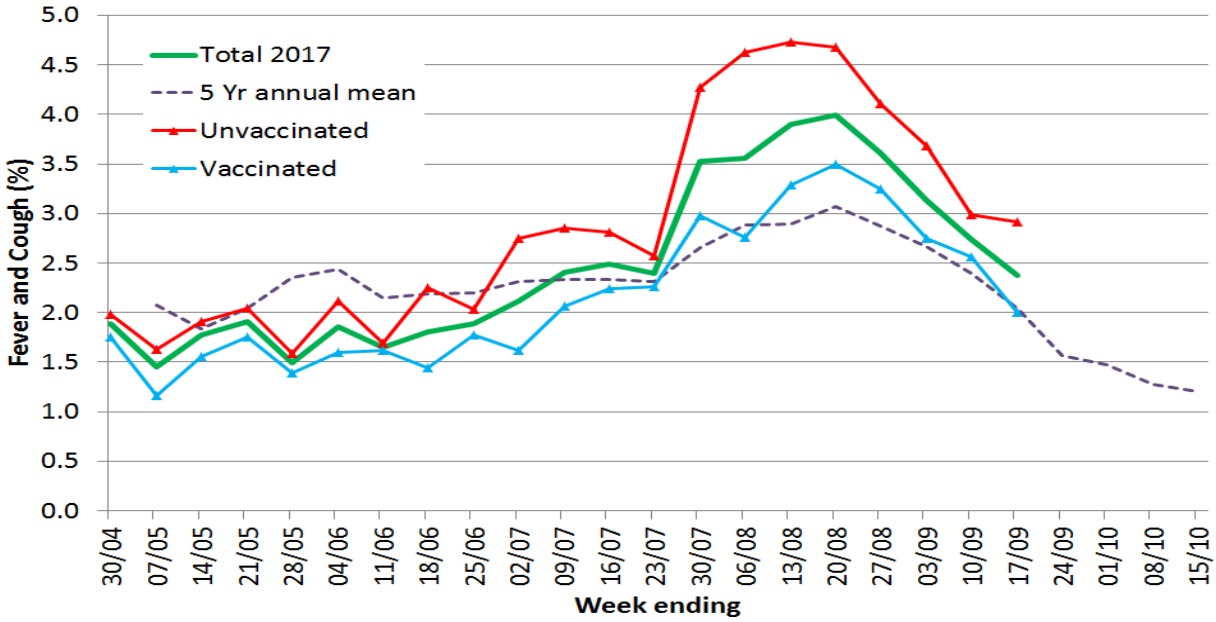
FluTracking.net

FluTracking.net is an online health surveillance system to detect epidemics of influenza. It 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 37 FluTracking received reports for 8,315 people in NSW with the following results:

- 2.4% of respondents reported fever and cough, down from the previous week (2.7%) but still above the 5 year annual mean (Figure 10).
- Among respondents who reported being vaccinated for influenza in 2017, 2.0% reported fever and cough compared to 2.9% for unvaccinated respondents (Figure 10).
- Overall, 1.6% of respondents reported fever, cough and absence from normal duties, lower than the previous week (1.9%).

Figure 10: FluTracking – Percent of NSW participants reporting fever and cough overall, compared to the 5 year average and by reported influenza vaccination status, 2017.*



Notes: From 2016, if a participant reported influenza-like illness symptoms for more than one consecutive week, only the first reported week of symptoms is included. Participants are not considered vaccinated until two or more weeks have elapsed since their recorded time of vaccination. Vaccinated and Unvaccinated rates are calculated using the total number of vaccinated respondents and the total number of unvaccinated respondents as denominators, respectively. The 5-year annual mean is calculated from years 2012 to 2016.

For further information on the project and how to participate 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. 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 usual variation upper limit, then it may be an indication that influenza is beginning to circulate widely.

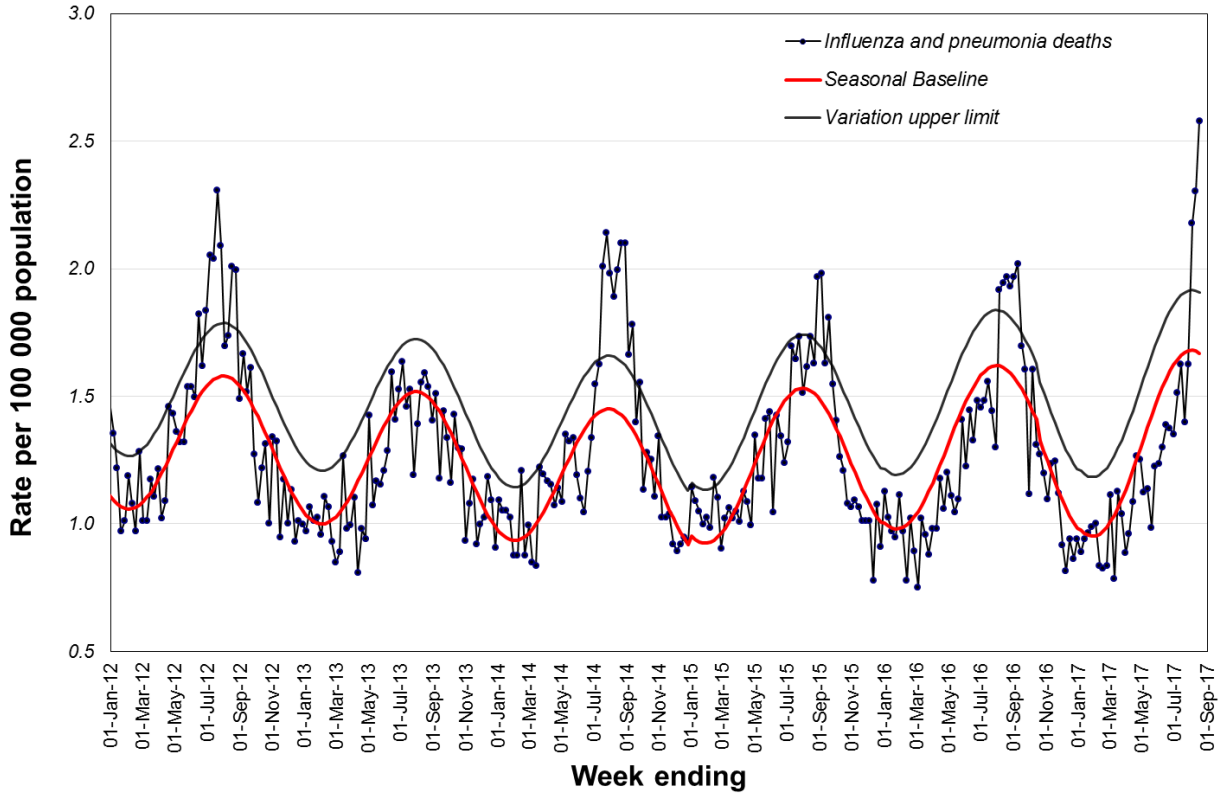
Due to delays in the death registration process, death data for recent weeks are highly variable. For this reason, death data from the four most recent weeks are not included in the report.

For the week ending 18 August 2017:

- There were 2.58 *influenza and pneumonia* deaths per 100 000 NSW population, which has exceeded the usual variation upper limit of 1.91 per 100 000 population (Figure 8). This was a notable increase on the previous reported rate of 1.90 for the week ending 4 August.

For the year up to 18 August 2017, 182 of the 34,078 death certificates mentioned influenza; one death was reported in a child aged 5 to 14 years, one in an adult aged 15 to 24 years, two deaths in people aged 35 to 54 years and the remaining deaths have been in people aged over 55 years. A total of 3,136 (9.2%) of the 34,078 death certificates mentioned pneumonia.

Figure 9: Rate of deaths classified as *influenza and pneumonia* per 100 000 NSW population, 2012 – 18 August 2017.



Source: NSW Registry of Births, Deaths and Marriages.

*** Notes on interpreting death data:**

1) The number of deaths mentioning "Pneumonia or influenza" is reported as a rate per 100,000 NSW population. Using the NSW population provides a more stable and reliable denominator than deaths from all causes.
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 at least 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.

5. National and International Influenza Surveillance

National Influenza Surveillance

In the *Australian Surveillance Report No.8,* with data up to 1 September 2017, influenza activity at the national level decreased this reporting fortnight after reaching a peak in weeks 32 and 33. However, high levels of activity continued to be reported in a majority of regions. Of note:

- There has been more than two and a half times the number of laboratory confirmed notifications of influenza reported to the National Notifiable Diseases Surveillance System (NNDSS) this year when compared with the same period last year.
- Influenza A(H3N2) is the predominant circulating influenza A virus nationally. Influenza B viruses also continue to circulate, with the proportion of influenza B increasing.
- Notification rates have been highest in adults aged 80 years or older, with a secondary peak in young children, aged 5 to 9 years. Hospitalisations with confirmed influenza decreased, following a peak in week 32. The proportion of patients admitted directly to ICU has been lower than recent years.
- Antigenic characterisation of circulating influenza viruses suggests the seasonal influenza vaccines are a moderate to good match for circulating virus strains, depending on the strain.

For further information see the Australian Influenza Surveillance Reports.

Global Influenza Update

The latest WHO global update on 18 September 2017 provides data up to 3 September. WHO reports that influenza activity remained at low levels in the temperate zone of the northern hemisphere. High levels of influenza activity continued to be reported in the temperate zone of the southern hemisphere and in some countries of South and South East Asia. In Central America and the Caribbean influenza activity continued to be reported in a few countries. Worldwide, influenza A(H3N2) viruses were predominating.

For further information see the WHO influenza surveillance reports.

Influenza at the human-animal interface

WHO publishes regular updated risk assessments of human infections with avian and other non-seasonal influenza viruses at Influenza at the human-animal interface, with the most recent report published on 25 July 2017. These reports provide information on human cases of infection with non-seasonal influenza viruses, such as H5 and H7 clade viruses, and outbreaks among animals.

A report entitled *Human cases of influenza at the human-animal interface, January 2015–April 2017* has also been recently published in the WHO Weekly Epidemiological Record. Of note, there has been no sustained human-to-human transmission identified in any of the events; there has been a considerable surge in human cases of A(H7N9) virus infection; there has been a sharp decrease in reported human infections with A(H5N1) viruses; and approximately one quarter of cases of human infections with swine influenza variant viruses were severe and one case was fatal.

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

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

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

6. Composition of 2017 Australian influenza vaccines

In Australia, all influenza vaccines included in the National Immunisation Program in 2017 are quadrivalent influenza vaccines and have the following composition:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus (changed from the 2016 vaccines)
- an A/Hong Kong/4801/2014 (H3N2)-like virus
- a B/Brisbane/60/2008-like virus (Victoria lineage)
- a B/Phuket/3073/2013-like virus (Yamagata lineage).

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