Influenza Monthly Epidemiology Report, NSW

March 2018

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 Reports at http://www.health.nsw.gov.au/Infectious/reports/Pages/CDWR.aspx .

1. Summary

- Influenza activity continued to decline throughout March, although activity still remains slightly higher than previous years. Both A and B strains are circulating at similar levels.
- The rate of influenza like illness (ILI) presentations to selected emergency departments was low and consistent with inter-seasonal activity.

2. Hospital Surveillance

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

The PHREDSS surveillance system uses a statistic called the 'index of increase' to indicate when ILI presentations [2] are increasing at a statistically significant rate. It accumulates the difference between the previous day's count of presentations and the average for that weekday over the previous 12 months. An index of increase value of 15 is considered an important indicator for the start of the influenza season in NSW as it suggests influenza is circulating widely in the community.

In March 2018:

- Presentations in the *All respiratory illness, fever and unspecified infections* category increased but were within the historical range for this time of year. At this time of year these are more likely to represent respiratory conditions other than influenza, such as asthma and bronchiolitis (Figure 1).
- The index of increase for ILI presentations was 1.1 at the end March, well below the seasonal threshold of 15.
- ED presentations for ILI were steady and were within the historical range for this time of year overall (Figure 2).
- ED presentations for pneumonia [3] increased but were within the historical range for this time of year (Figure 3).

[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 proceeding five years. Recent counts are subject to change. As of 31 March 2016, data from 60 NSW emergency departinnts (EDs), representing approximately 82% of ED visits in the 2015-16 financial year. The coverage of rural EDs is lower than the metropolitan EDs. Data shown represents unplanned presentations to hospital EDs.
[2] The ED 'ILI' syndrome includes provisional diagnosis 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'.

- Pneumonia or ILI presentations which resulted in admissions to critical care units increased but were with the historical range for this time of year (data not shown).
- Bronchiolitis presentations increased but were within the usual range for this time of year, overall (Figure 4).

Figure 1: Total weekly counts of ED visits for any respiratory illness, fever and unspecified infections, all ages, 2018 (black line) to 1 April, compared with the 5 previous years (coloured lines).

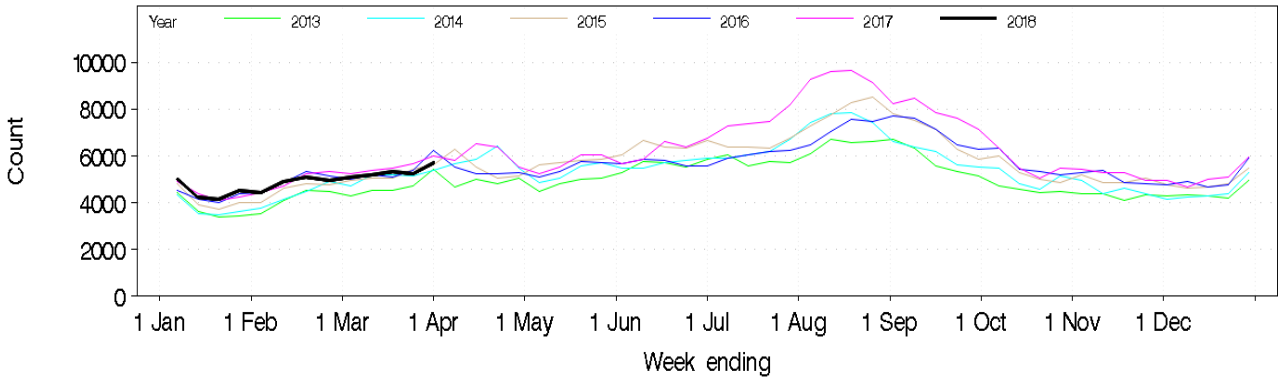


Figure 2: Total weekly counts of ED visits for influenza-like illness, all ages, 2018 (black line) to 1 April, compared with the 5 previous years (coloured lines).

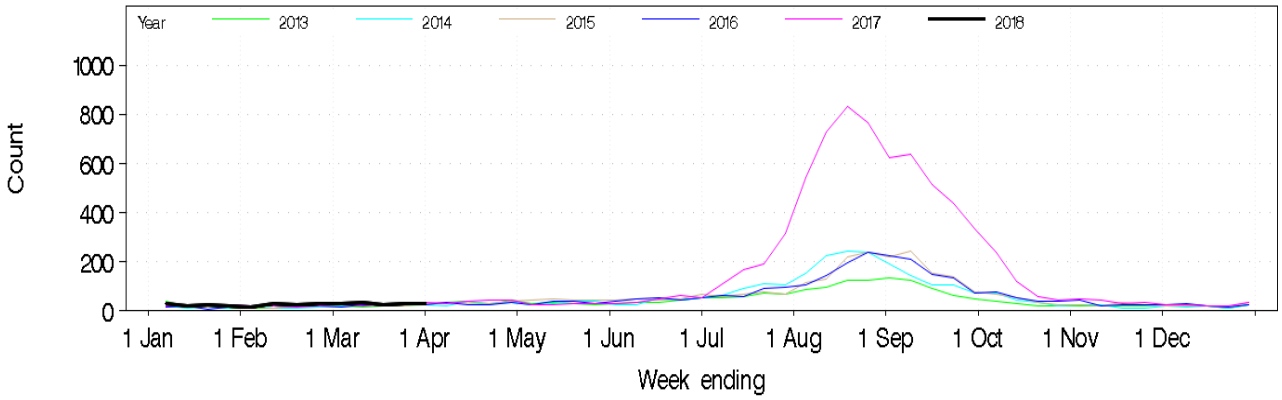


Figure 3: Total weekly counts of Emergency Department visits for pneumonia, 2018 (black line) to 1 April, compared with the 5 previous years (coloured lines).

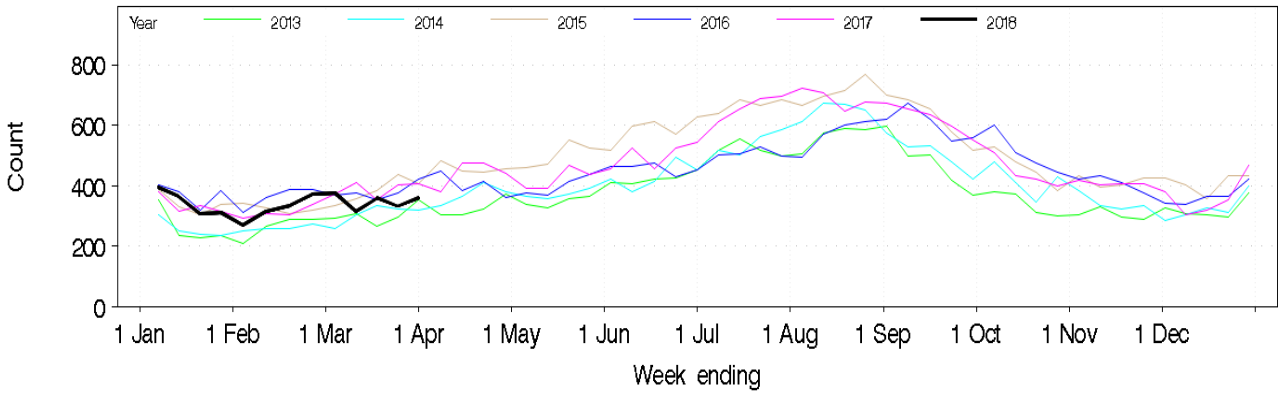
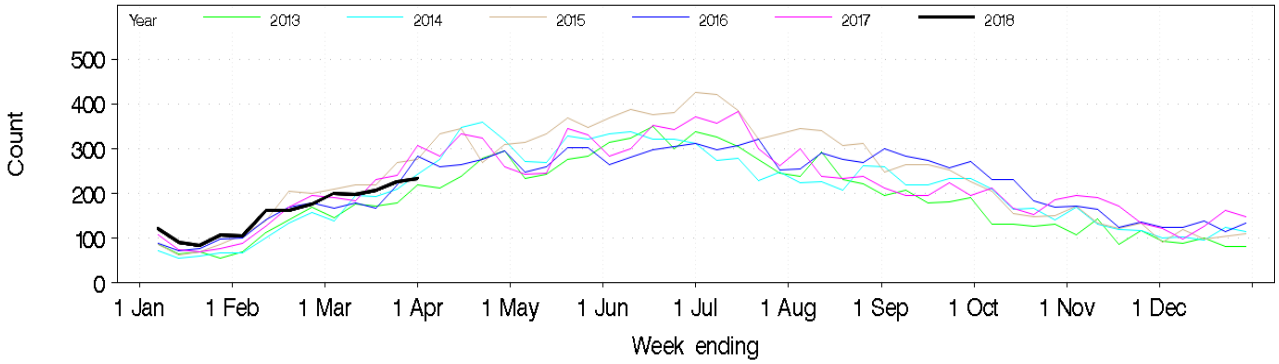


Figure 4: Total weekly counts of Emergency Department visits for bronchiolitis, 2018 (black line) to 1 April, compared with the 5 previous years (coloured lines).



3. Laboratory testing summary for influenza

Sentinel laboratory surveillance for influenza and other respiratory viruses is conducted throughout the year [4]. In February 2018:

- A total of 22518 tests for respiratory viruses were performed at sentinel NSW laboratories and 948 (4.2%) were positive for influenza (Table 1), lower than the previous month (7.1%).
- 524 specimens tested positive for influenza A – 52 of these tested positive for A(H3N2), 49 tested positive for influenza A(H1N1) and 423 were not typed further (Table 1, Figure 5 & 6).
- 424 cases of influenza B were reported (Table 1, Figure 5 & 6).

The influenza test positive rate was slightly higher than usual earlier in March but declined throughout the remainder of the month and is now back to usual pre-seasonal levels.

Respiratory syncytial virus (RSV) activity started to increase. This fits with the historical pattern of increasing RSV activity during the autumn months and is consistent with the rise in emergency department presentations for bronchiolitis noted earlier in the month in the PHREDSS data.

Rhinovirus detections decreased but remained the leading respiratory viruses identified by laboratories.

[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. Preliminary laboratory data is provided by participating sentinel laboratories on a weekly basis and are subject to change. **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.

Table 1: Summary of testing for influenza and other respiratory viruses at sentinel NSW laboratories, 1 January to 1 April 2018.

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	(%)						
28/01/2018	12819	483	(3.8%)	26	(5.4%)	38	(7.9%)	414	(85.7%)	507	(4.0%)	404	599	492	1601	325	196
25/02/2018	14540	531	(3.7%)	46	(8.7%)	35	(6.6%)	448	(84.4%)	503	(3.5%)	374	552	846	2498	221	284
01/04/2018*	22518	524	(2.3%)	52	(9.9%)	49	(9.4%)	423	(80.7%)	424	(1.9%)	703	1057	2022	4775	306	485
Week ending																	
04/03/2018	4163	127	(3.1%)	19	(15.0%)	8	(6.3%)	100	(78.7%)	110	(2.6%)	126	168	270	931	58	78
11/03/2018	4694	129	(2.7%)	13	(10.1%)	13	(10.1%)	103	(79.8%)	92	(2.0%)	148	205	378	1024	79	107
18/03/2018	4733	81	(1.7%)	9	(11.1%)	5	(6.2%)	67	(82.7%)	84	(1.8%)	140	217	423	968	54	100
25/03/2018	4654	106	(2.3%)	4	(3.8%)	13	(12.3%)	89	(84.0%)	81	(1.7%)	151	251	474	986	57	108
01/04/2018	4274	81	(1.9%)	7	(8.6%)	10	(12.3%)	64	(79.0%)	57	(1.3%)	138	216	477	866	58	92

Notes:
* Five week period
** HMPV - Human metapneumovirus.
All samples are tested for influenza viruses but not all samples are tested for all of the other viruses listed.

Figure 5: Weekly influenza positive test results by type and sub-type reported by NSW sentinel laboratories, 1 January to 1 April 2018.

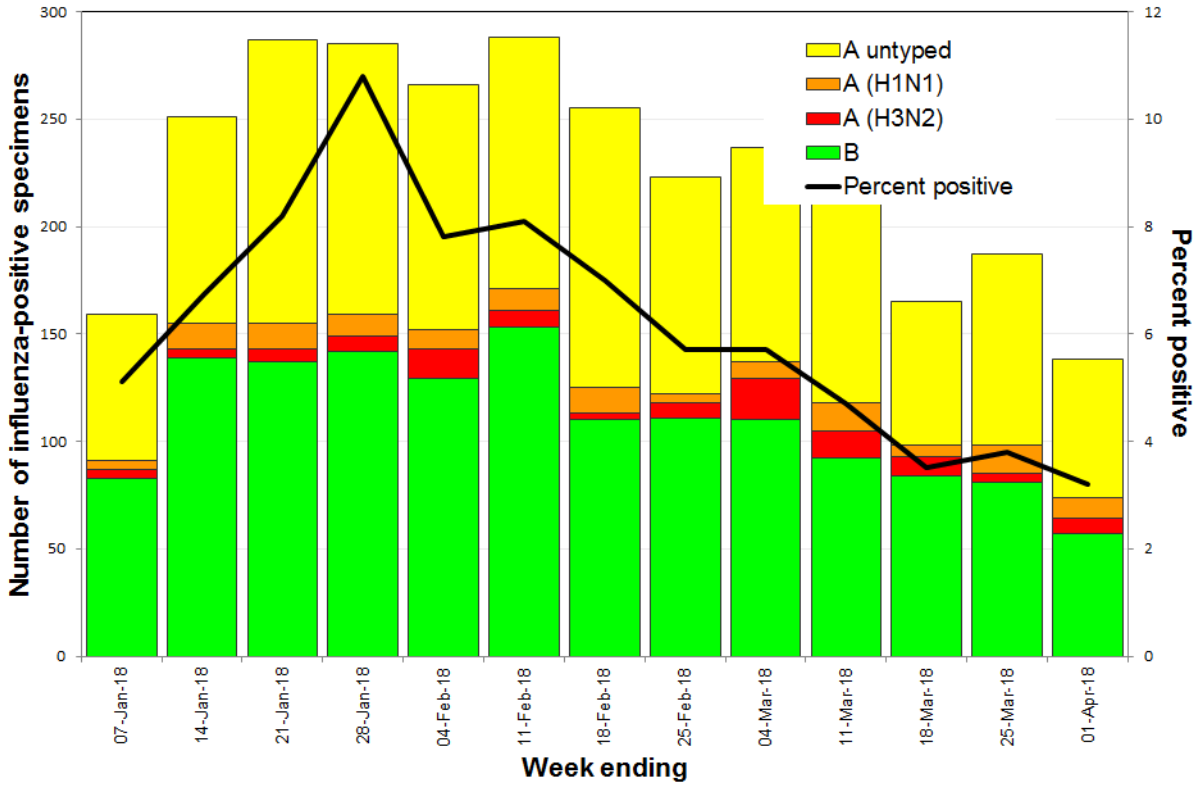
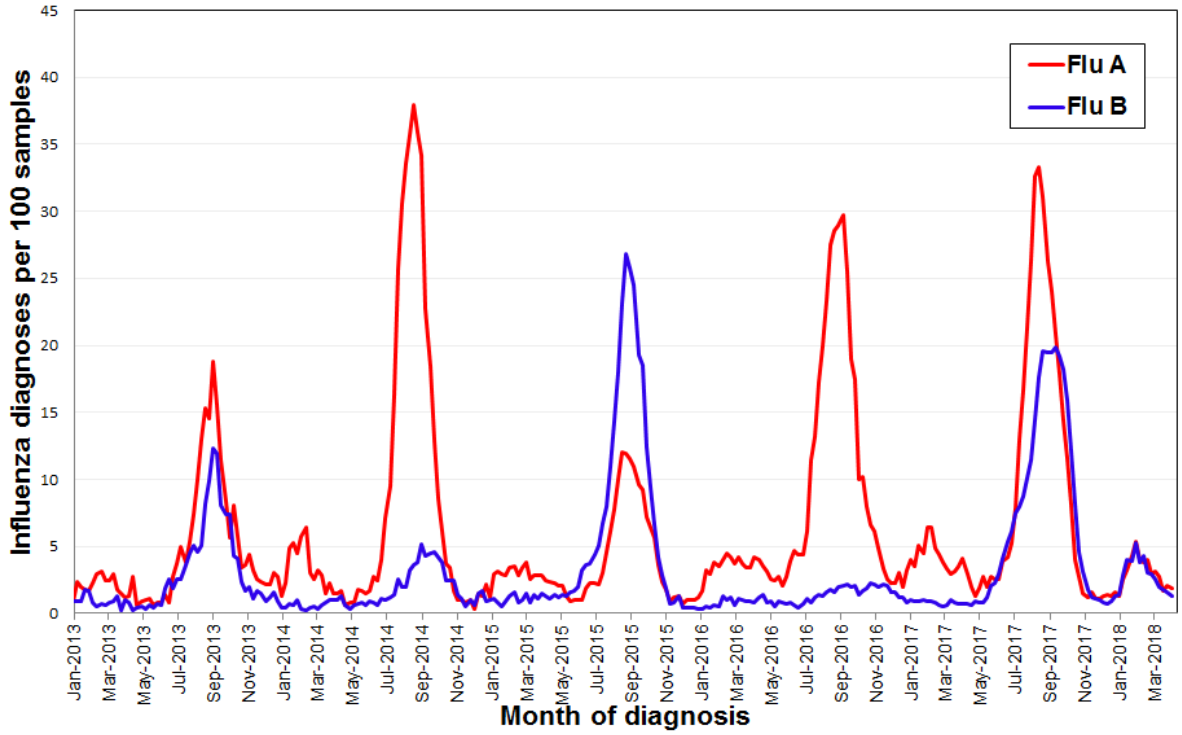


Figure 6: Percent of laboratory tests positive for influenza A and influenza B reported by NSW sentinel laboratories, 1 January 2013 to 1 April 2018.



4. Community Surveillance

Influenza notifications by Local Health District (LHD)

During March there were 972 (5 week period) notifications of influenza confirmed by polymerase chain reaction (PCR) testing, higher than the 869 influenza notifications reported for March 2017 and lower than the notifications reported for February 2018 (1144).

Rates were low and similar across all LHDs with the exception of Northern NSW which reported the highest notification rate well above other LHDs in the last week of March. This could be associated with the Commonwealth Games(Table 2).

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

Local Health District	Week ending 01 Apr 2018		Average (previous 4 weeks)	
	Number of notifications	Rate per 100 000 population	Number of notifications	Rate per 100 000 population
Central Coast	5	1.43	6	1.65
Hunter New England	10	1.07	17	1.84
Illawarra Shoalhaven	2	0.48	5	1.21
Mid North Coast	4	1.78	3	1.45
Murrumbidgee	3	1.24	5	1.96
Nepean Blue Mountains	4	1.03	8	2.05
Northern NSW	14	4.52	9	2.83
Northern Sydney	27	2.92	47	5.05
South Eastern Sydney	25	2.66	35	3.72
South Western Sydney	16	1.59	17	1.71
Southern NSW	3	1.38	5	2.46
Sydney	16	2.39	21	3.1
Western NSW	0	0	2	0.8
Western Sydney	10	1	30	2.96

Note:

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

Influenza outbreaks in institutions

There were eight respiratory outbreaks reported this month, all in residential care facilities, including 6 caused by influenza (four influenza A and two influenza B) (Table 3, Figure 7). For the other two outbreaks, one result is pending and the other was due to rhinovirus.

In the year to date there have been 9 laboratory confirmed influenza outbreaks in institutions reported to NSW public health units (Table 4): 6 have been due to influenza A, 3 were due to influenza B.

In outbreaks affecting aged care facilities, at least 68 residents were reported to have had ILI symptoms and 14 required hospitalisation. Overall, there have been 2 deaths in residents reported linked to these outbreaks, both 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 predominated in 2012, 2014, 2016 and 2017.

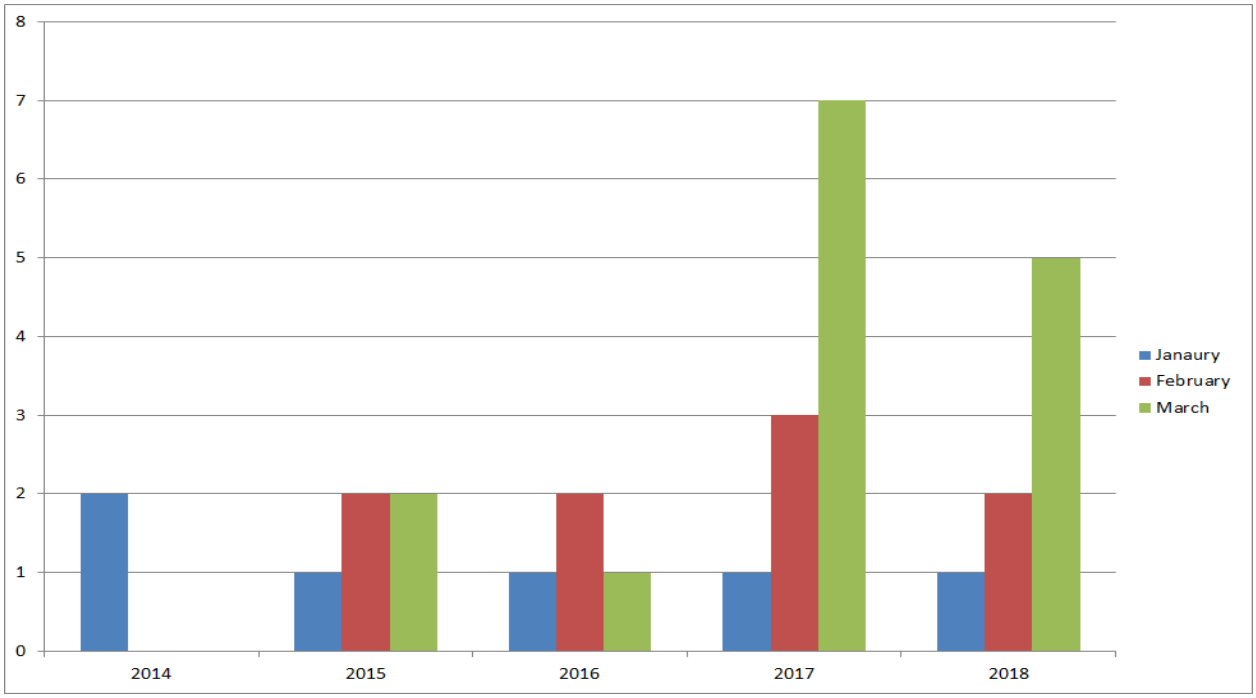
In 2015, influenza B was the predominant strain, and was also associated with an increase in influenza outbreaks in institutions, particularly residential aged care facilities (Table 3).

Table 3: Reported influenza outbreaks in NSW institutions, January 2011 to March 2018.

Year	2011	2012	2013	2014	2015	2016	2017	2018*
No. of outbreaks	4	39	12	120	103	279	588	9

Notes:
* Year to date.

Figure 7: Reported influenza outbreaks in NSW residential care facilities by month, 2014 to 2018.



5. National and International Influenza Surveillance

National Influenza Surveillance
Although national influenza surveillance reports are not produced at this time of year, many jurisdictions are reporting increased influenza activity. Total national reports of laboratory-confirmed influenza in February were higher than 2017 and also higher than in earlier years.

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

Global Influenza Update
The latest WHO global update on 02 April 2018 provides data up to 18 March. Influenza activity appeared to decrease in most of the countries in the temperate zone of the northern hemisphere, with exception of Eastern Europe where activity continued to increase. In the temperate zone of the southern hemisphere, influenza activity remained at inter-seasonal levels. Worldwide, influenza A and influenza B accounted for a similar proportion of influenza detections.

Follow the link for 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 2 March 2018. 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.

Since the previous update, new human infections with avian influenza A(H7N4), A(H7N9) and A(H9N2) viruses were reported. 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 2018 Australian influenza vaccines

The WHO Consultation on the Composition of Influenza Vaccines for the 2018 Southern Hemisphere was held in Melbourne on 25-27 September 2017.

The consultation report noted that during the period February – September 2017, influenza A(H3N2) viruses were associated with outbreaks in many countries. The majority of recent viruses were antigenically related to 3C.2a clade A/Hong Kong/4801/2014-like viruses but reacted poorly with ferret antisera raised to the egg-propagated A/Hong Kong/4801/2014-like viruses used in current seasonal vaccines. Influenza A(H3N2) viruses within the 3C.2a clade and 3C.2a1 subclade have become genetically diverse.

Recent A(H3N2) viruses were better inhibited by a ferret antiserum raised against the egg-propagated reference virus, A/Singapore/INFIMH-16-0019/2016, compared to ferret antisera raised against other egg-propagated A(H3N2) viruses.

Influenza A(H1N1) and influenza B/Victoria lineage strains identified in the same period were antigenically and genetically closely related to the corresponding strains in the current vaccines.

Following the Consultation, WHO announced its recommendations for the composition of quadrivalent vaccines for use in the 2018 Southern Hemisphere influenza season, which includes changes in the influenza A(H3N2) components, as follows:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus
- an A/Singapore/INFIHM-16-0019/2016 (H3N2)-like virus [5]
- a B/Phuket/3073/2013-like virus (Yamagata lineage)
- a B/Brisbane/60/2008-like virus (Victoria lineage).[6]

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

The WHO consultation on the composition of influenza vaccines for the Northern Hemisphere 2018-19 influenza season was held in February 2018. WHO announced its recommendations for the composition of quadrivalent vaccines for use in the 2018-19 Northern Hemisphere influenza season, which includes changes in the influenza A(H3N2) and influenza B (Victoria lineage) components, as follows:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus[7];
- an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus;
- a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage)[8]; and
- a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage).

[5] This replaces A/Hong Kong/4801/2014 (H3N2)-like virus used in the 2017 seasonal influenza vaccines.
[6] This B/Brisbane strain had been part of the WHO recommendations for 2017 southern hemisphere trivalent influenza vaccines but has been replaced by the B/Phuket strain for 2018 trivalent vaccines.
[7] This replaces A/Hong Kong/4801/2014 (H3N2)-like virus used in the 2017-8 seasonal influenza vaccines.
[8] This replaces B/Brisbane/60/2008-like virus used in the 2017-8 seasonal influenza vaccines. The B/Colorado will make up the B component of the trivalent vaccine.