Influenza Monthly Epidemiology Report, NSW

April 2017

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 during April was generally low as is typical for this time of year. Influenza A(H3N2) remained the most common strain identified.
- 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 remained low.

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 April 2017:

- The index of increase for ILI presentations was 7.6 at the end April, higher than at the end of March (4.4) but still well below the seasonal threshold of 15.
- ED presentations for ILI were slightly above the historical range for this time of year overall (Figure 1). Presentations were above the usual range for this time of year at the Shellharbour and Royal Prince Alfred Hospitals.
- ED presentations for pneumonia [3] were within the historical range for this time of year (Figure 2).
- Pneumonia or ILI presentations which resulted in admissions to critical care units for ILI and pneumonia were within the historical range for this time of year (data not shown).

[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 departments (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'.

- Bronchiolitis presentations decreased this month and were within the usual range for this time of year, overall (Figure 3). Presentations were above the usual range for this time of year at Concord Hospital (data not shown).
- The category combining all respiratory, fever and unspecified infection presentations was above the usual range for this time of year overall, particularly for people aged 35 years and over and at Nepean Hospital (data not shown).

Figure 1: Total weekly counts of ED visits for influenza-like illness, April 2017 (black line), compared with each of the 5 previous years (coloured lines), for 60 NSW hospitals.*

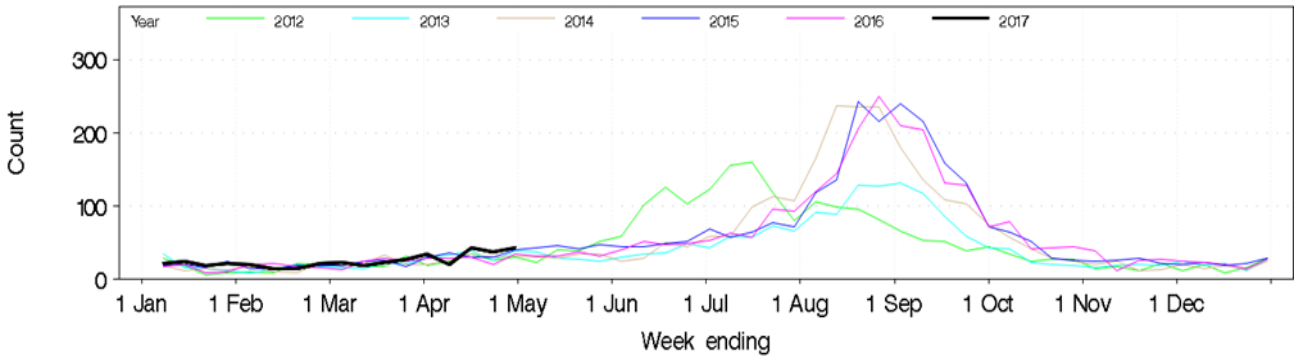


Figure 2: Total weekly counts of ED presentations for pneumonia, April 2017 (black line), compared with each of the 5 previous years (coloured lines), for 60 NSW hospitals.

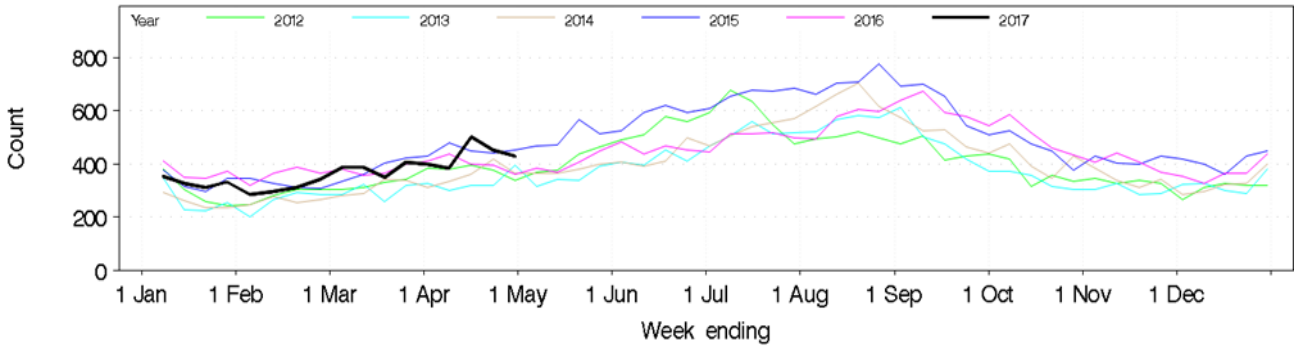
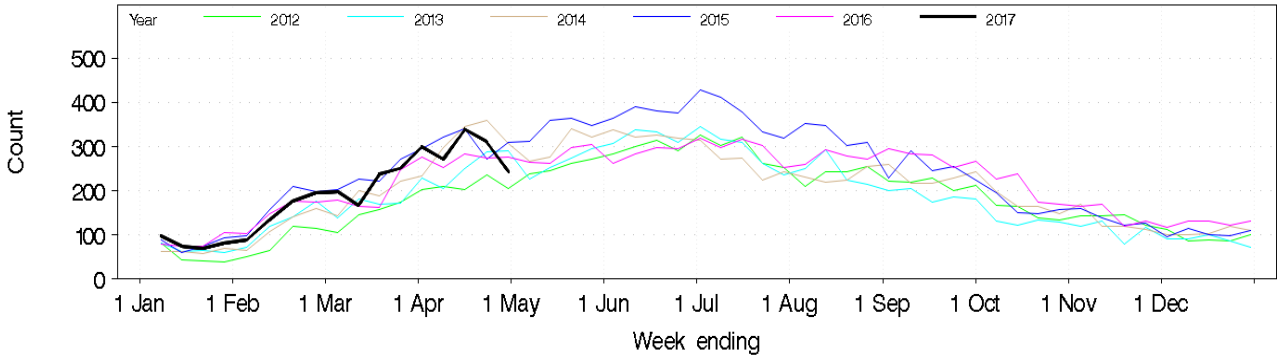


Figure 3: Total weekly counts of Emergency Department visits for bronchiolitis, April 2017 (black line), compared with the 5 previous years (coloured lines).



3. Laboratory testing summary for influenza

Sentinel laboratory surveillance for influenza and other respiratory viruses is conducted throughout the year [4]. In April 2017:

- A total of 18,089 tests for respiratory viruses were performed at sentinel NSW laboratories and 472 (2.7%) were positive for influenza (Table 1).
- 377 specimens tested positive for influenza A – 54 of these tested positive for A(H3N2), 15 tested positive for influenza A(H1N1) and 308 were not typed further (Table 1, Figure 4 & 5).
- 135 cases of influenza B were reported (Table 1, Figure 4 & 5).

Influenza activity for April was low and the rate was similar to previous years. Activity picked up slightly in the last week of April.

Respiratory syncytial virus (RSV) activity remained elevated overall although activity decreased towards the end of the month. It is too early to say if RSV has reached its peak. 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.

Table 1: Summary of testing for influenza and other respiratory viruses at sentinel NSW laboratories, 2 January to 30 April 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	9981	489	(4.9%)	53	(10.8%)	4	(0.8%)	432	(88.3%)	92	(0.9%)	374	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*	21161	724	(3.4%)	78	(10.8%)	12	(1.7%)	634	(87.6%)	158	(0.7%)	684	1000	1830	5427	290	530
30/04/2017	18089	377	(2.1%)	54	(14.3%)	15	(4.0%)	308	(81.7%)	135	(0.7%)	588	901	2600	4202	231	468
Week ending																	
09/04/2017	4973	148	(3.0%)	21	(14.2%)	5	(3.4%)	122	(82.4%)	35	(0.7%)	169	256	672	1177	53	157
16/04/2017	4509	91	(2.0%)	12	(13.2%)	3	(3.3%)	76	(83.5%)	27	(0.6%)	139	222	642	1068	69	114
23/04/2017	4276	56	(1.3%)	11	(19.6%)	4	(7.1%)	41	(73.2%)	37	(0.9%)	119	203	690	1040	57	99
30/04/2017	4331	82	(1.9%)	10	(12.2%)	3	(3.7%)	69	(84.1%)	36	(0.8%)	161	220	596	917	52	98

Notes:
***** 5 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.

[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, VDRLab to June 2016.

Figure 4: Weekly influenza positive test results by type and sub-type reported by NSW sentinel laboratories, 2 January to 30 April 2017.

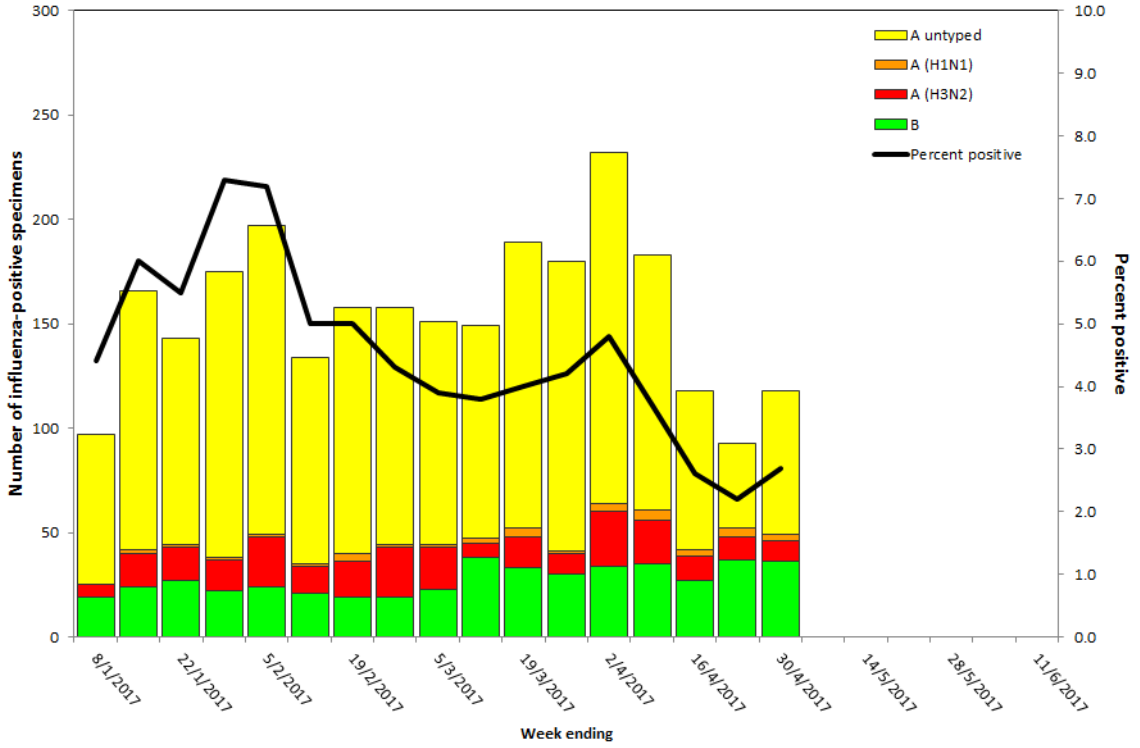
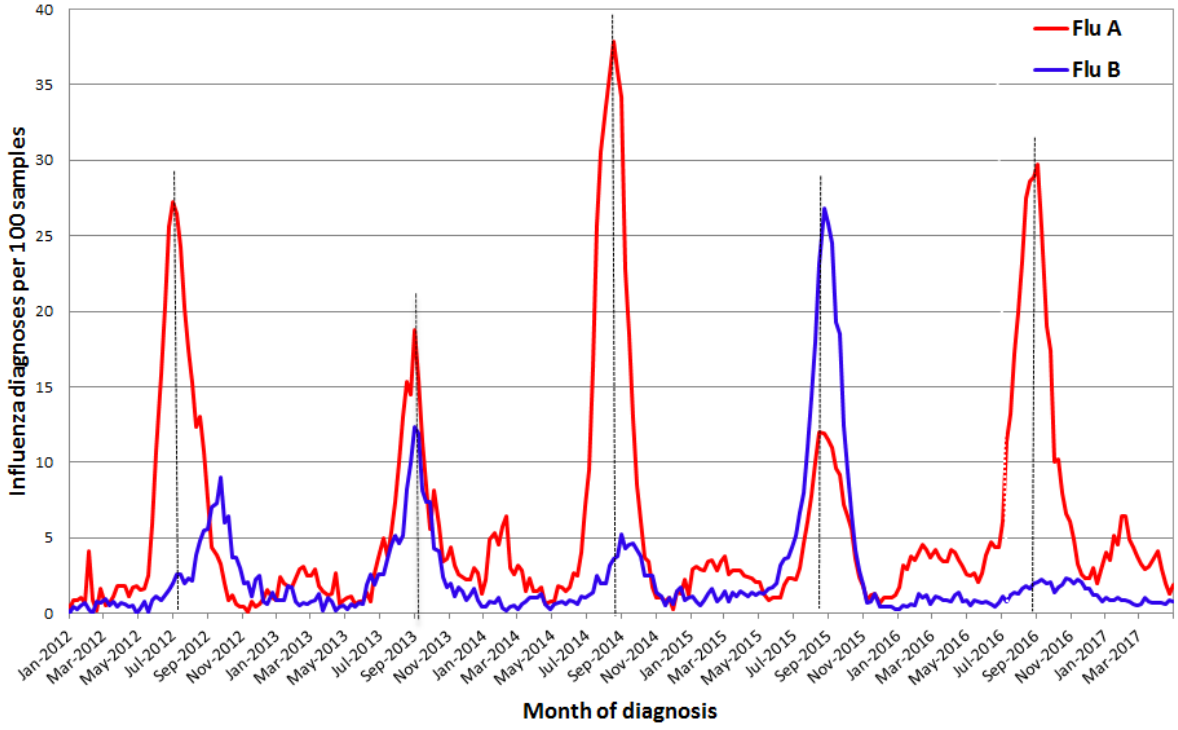


Figure 5: Percent of laboratory tests positive for influenza A and influenza B reported by NSW sentinel laboratories, 2 January 2012 to 30 April 2017.



4. Community Surveillance

Influenza notifications by Local Health District (LHD)

During April there were 514 notifications of influenza confirmed by polymerase chain reaction (PCR) testing, slightly lower than the 598 influenza notifications reported for April 2016.

Rates were low and similar across all LHDs. In the final week of the month rates were highest in Sydney and South Eastern Sydney LHDs (Table 2).

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

Local Health District	Week ending 30 Apr 2017		Average (previous 4 weeks)	
	Number of notifications	Rate per 100 000 population	Number of notifications	Rate per 100 000 population
Central Coast	4	1.16	3	0.87
Far West	0	0	1	3.27
Hunter New England	8	0.86	22	2.34
Illawarra Shoalhaven	6	1.47	7	1.71
Mid North Coast	1	0.45	3	1.35
Murrumbidgee	2	0.83	2	0.72
Nepean Blue Mountains	6	1.56	6	1.56
Northern NSW	5	1.63	8	2.45
Northern Sydney	17	1.86	32	3.47
South Eastern Sydney	20	2.16	21	2.21
South Western Sydney	6	0.61	17	1.72
Southern NSW	2	0.93	2	0.7
Sydney	18	2.75	13	1.91
Western NSW	1	0.36	2	0.83
Western Sydney	13	1.34	21	2.11

Note:

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

Influenza outbreaks in institutions

There were four respiratory outbreaks reported this month in residential care facilities. Only one was caused by influenza (influenza A not further typed), bringing the cumulative total for this year to 13 (Table 3). Influenza was excluded as the cause of the other three outbreaks.

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, 2014 and 2016 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, January 2010 to April 2017.

Year	2010	2011	2012	2013	2014	2015	2016	2017*
No. of outbreaks	2	4	39	12	120	103	279	13

Notes:
* Year to date.

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

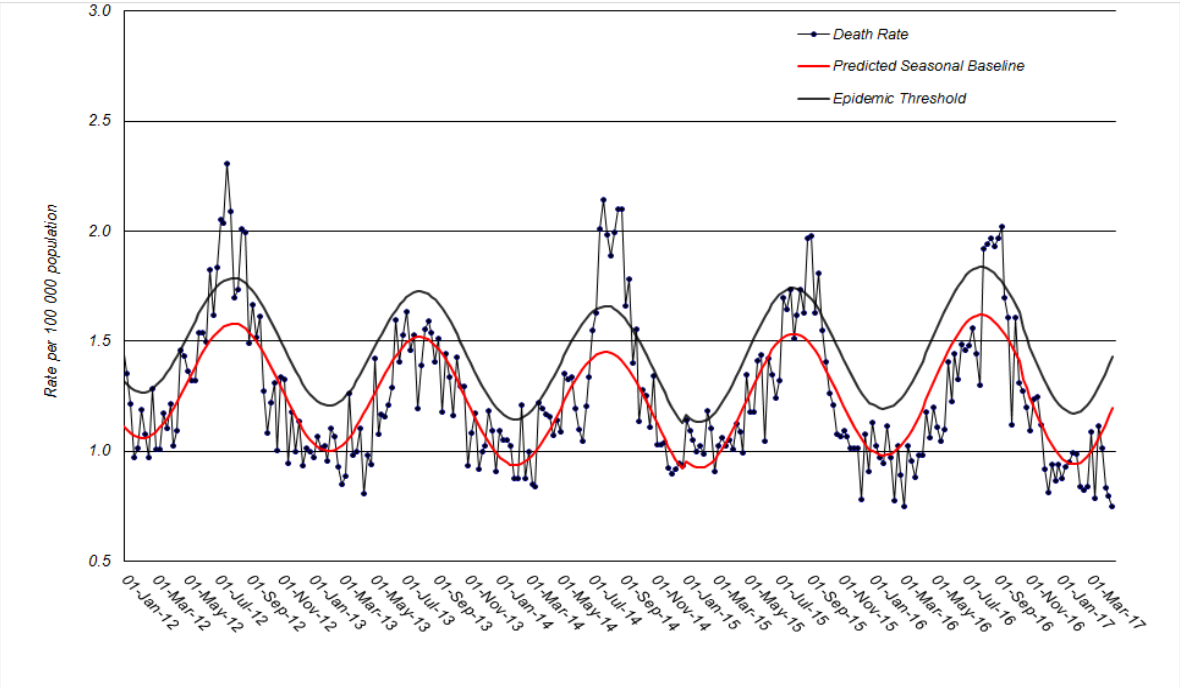
Deaths registration data is routinely reviewed for deaths attributed to pneumonia or influenza. While pneumonia has many causes, a well-known indicator of seasonal and pandemic influenza activity is an increase in the number of death certificates that mention pneumonia or influenza as a cause of death.

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 14 April 2017:

- In 2017 only 8 of the 13,420 death certificates mentioned influenza; all deaths have been in people aged over 65 years.
- A total of 1,068 of the 13,420 death certificates mentioned pneumonia.
- There were 0.75 influenza and pneumonia deaths per 100 000 NSW population, which was below the epidemic threshold of 1.43 per 100 000 population (Figure 7).

Figure 7: Rate of deaths classified as influenza and pneumonia per 100 000 NSW population, 2012 - 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. This is because pneumonia and influenza are known to contribute to increases in deaths from non-respiratory illnesses, such as deaths due to ischaemic heart disease. As the number of these deaths will increase with rises in influenza activity, the actual effect of influenza on mortality rates will be obscured if all-cause mortality is used as the denominator. This limitation is avoided by using the NSW population, which is relatively constant throughout the year, as the denominator.

2) Deaths referred to a coroner during the reporting period may not be available for analysis. Deaths in younger people may be more likely to require a coronial inquest. Therefore influenza-related deaths in younger people may be under-represented in these data.

3) The interval between death and death data availability is usually at least 7 days, and so these data are 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.

6. 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 January were high compared to 2016 and to 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 1 May 2017 provides data up to 16 April. WHO reports that influenza activity in the temperate zone of the northern hemisphere continued decrease. Worldwide, influenza A(H3N2) and B viruses were predominant, with an increased proportion of influenza B viruses detected in recent weeks.

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 16 March 2017. 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.

7. Composition of 2017 Australian influenza vaccines

The WHO Consultation on the Composition of Influenza Vaccines for the 2017 Southern Hemisphere was held in Geneva on 26-28 September 2016.

Following the Consultation, WHO announced its recommendations for the composition of trivalent vaccine for use in the 2017 Southern Hemisphere influenza season as follows:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;
- an A/Hong Kong/4801/2014 (H3N2)-like virus;
- a B/Brisbane/60/2008-like virus (Victoria lineage)

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

Of note, there has been replacement of the A/California/7/2009 (H1N1)pdm09-like virus component with an A/Michigan/45/2015 (H1N1)pdm09-like virus in the vaccine recommendations, the first time the recommended A(H1N1) strain has changed since 2010.

All influenza vaccination included in the Australian National Immunisation Influenza Program in 2017 are quadrivalent vaccines.

More details about the most recent influenza vaccine recommendations can be found at: http://www.who.int/influenza/vaccines/virus/recommendations/2017_south/en/.

The WHO consultation on the composition of influenza vaccines for the Northern Hemisphere 2017-18 influenza season was held in February 2017. The recommended composition was unchanged from the composition recommended for the 2017 Southern Hemisphere vaccines. Information about the Northern Hemisphere vaccine recommendations can be found at: WHO | Recommended composition of influenza virus vaccines for use in the 2017-2018 northern hemisphere influenza season.