Influenza Updates

The newsletter of the WHO Collaborating Centre for Reference and Research on Influenza in Melbourne

Volume 4, Issue 3, December 2015

WHO Recommendations for the Southern Hemisphere 2016 influenza vaccines

The WHO Consultation on the Composition of Influenza Vaccines for the Southern Hemisphere 2016 was held in Memphis TN, USA in 21–23 September 2015. Following the Consultation, WHO made the following recommendation:

> *It is recommended that trivalent vaccines for use in the 2016 influenza season (southern hemisphere winter) contain the following:*
>
> *- an A/California/7/2009 (H1N1)pdm09-like virus;*
> *- an A/Hong Kong/4801/2014 (H3N2)-like virus;*
> *- a B/Brisbane/60/2008-like virus.*
>
> *It is recommended that quadrivalent vaccines containing two influenza B viruses contain the above three viruses and a B/Phuket/3073/2013-like virus.*

This differs from the previous vaccine recommendations (for the northern hemisphere 2015-2016), reflecting changes in circulating A(H3N2) viruses and increasing proportions of B/Victoria lineage viruses. More details can be found at: http://www.who.int/influenza/vaccines/virus/recommendations/2016_south/en/

Thank you to everyone who sent us influenza samples in the months prior to the Consultation. Your viruses provided essential data on circulating strains and helped to inform the choice of recommended vaccine strains. Please continue to send us your samples, as of course circulating influenza viruses continue evolve, and need for constant surveillance remains.

11th Australian Influenza Symposium

The 11th Australian Influenza Symposium was held in Geelong, Victoria on 12–13 October 2015, and was attended by almost 200 delegates from Australia, China, Hong Kong, New Zealand, Singapore, Thailand, United Kingdom and the United States.

A major theme of the symposium was avian-animal influenza viruses, with several talks focusing on avian and animal influenzas in countries such as USA, China and South Asia. A roundtable discussion considered the threat posed by zoonotic infections and surveillance systems for pandemic viruses. Other topics explored at the Symposium included surveillance in the American Tropics, vaccination policies, influenza biology, epidemiological studies, antiviral drugs and vaccines, surveillance systems and computer models of infection.

If you would like to stay informed about the 12th Australian Influenza Symposium please send us an email at: *symposium@influenzacentre.org*.

WHO Collaborating Centre for Reference and Research on Influenza
VIDRL

Visitors to the Centre

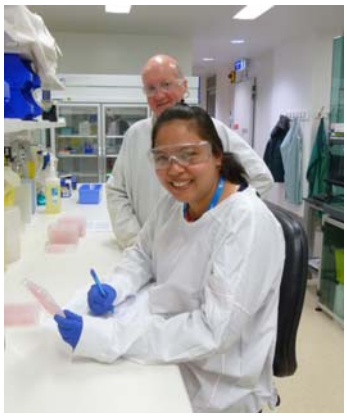
We have been pleased to welcome several visitors to the Centre in recent months.

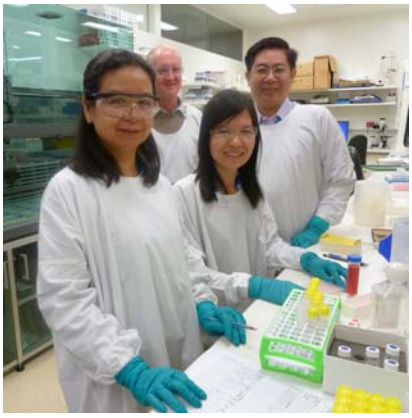
Dr Pan Yang, from the Chinese Center For Disease Control And Prevention, Beijing, China, visited the Centre from 21 September to 13 November 2015. Dr Yang undertook training in various techniques, including serology, molecular biology, antiviral resistance testing, data entry and egg culture of viruses.

Mrs Julie Ann Ira, from Canterbury Health Services, Christchurch, New Zealand, visited the Centre 5–9 October 2015 for training in serology techniques and HI assays.

Mrs Amelia Buys, from the National Institute for Communicable Diseases, Johannesburg, South Africa visited the Centre 16–20 November 2015 for an overview of Centre processes and operation of the Centre's Tecan EVO 200 liquid handling robot.

Dr Horm Srey Viseth (left) and **Ms Y Phalla** (centre), from the Institut Pasteur, Phnom Penh, Cambodia, and **Dr Chin Savuth** (right), from the National Public Health Laboratory, Phnom Penh, Cambodia visited the Centre from 4–13 November 2015. During their stay, Dr Horm, Ms Phalla and Dr Chin undertook training in sequencing of influenza genes and sequence analysis, egg inoculation and harvest for growth of influenza viruses, and influenza virus isolation in MDCK cells.





Recent activity at the Centre (1 August — 31 October 2015)

Following is a summary of samples processed at the Centre from 1 August to 31 October. With the peak of the Southern Hemisphere influenza season and the WHO Consultation for the Composition of Influenza Vaccines held in September, we have been extremely busy during this period.

Samples received

The Centre received 2408 influenza samples from the laboratories and institutions listed below between 1 August and 31 October 2015. This represents almost half of all samples received at the Centre for the whole year until the end of October.

AUSTRALIA: Canberra Hospital, John Hunter Hospital, Westmead Hospital, Royal Darwin Hospital, Queensland Health Forensic and Scientific Services, Royal Hobart Hospital, Healthscope Pathology, Melbourne Pathology, Austin Hospital, SA Pathology, Alfred Hospital, Monash Medical Centre, Royal Children's Hospital, Royal Melbourne Hospital, Pathwest QEII Medical Centre, VIDRL

FIJI: Fiji Centre for Communicable Disease Control

MACAU SAR: Macau Public Health Laboratory

NEW ZEALAND: Auckland Hospital, Institute of Environmental Science and Research, Canterbury Health Services

NEW CALEDONIA: Institut Pasteur

PAPUA NEW GUINEA: Institute of Medical Research

SOUTH AFRICA: National Institute for Communicable Diseases

SRI LANKA: Medical Research Institute

Isolation of viruses in eggs

The Centre undertakes primary isolation of selected viruses in eggs to obtain potential vaccine strains. From 1 August to 31 October 2015, 4 A(H1N1)pdm09, 1 A(H3N2), 1 B/Victoria and 4 B/Yamagata viruses have been successfully isolated in eggs at the Centre.

	Antigenic analysis: A total of 1215 influenza isolates were analysed by HI assay.				**Neuraminidase inhibitor susceptibility:** A total of 711 influenza isolates were tested by neuraminidase inhibition (NAI) assay for susceptibility to oseltamivir, zanamivir, peramivir and laninamivr.			
Country of submitting laboratory	**No. of viruses analysed by HI assay***				**No. of viruses tested by NAI assay***			
	A(H1N1) pdm09	A(H3N2)	B/Vic	B/Yam	A(H1N1) pdm09	A(H3N2)	B/Vic	B/Yam
Australia	65	188	346	252	36	156	85	95
Cambodia	13	15			13	39		
Fiji				5				
Macau SAR		1		9				
Malaysia		1						
New Caledonia			1	16				
New Zealand	2	18	53	93	2	26	31	75
Philippines	6	1			6	2		
Singapore	35	28	8	18	35	48	7	18
South Africa	10	3		4	6	7		
Sri Lanka	22	1		1	22	1		1
Total	**153**	**256**	**408**	**398**	**120**	**279**	**123**	**189**

* *Subtypes and lineages are based on analysis of HA and in some cases confirmed by genetic analysis of NA.*

Recent activity at the Centre (1 August — 31 October 2015) (continued)

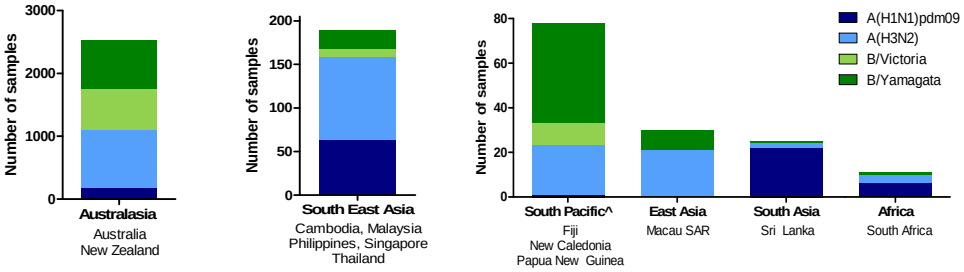
Country of submitting laboratory	**Genetic analysis:** Sanger sequencing was performed on 111 HA, 109 NA, 37 MP and 28 NS genes from 112 viruses. The HA, NA and MP genes of 274 A(H3N2) viruses were also analysed by next generation sequencing (NGS) techniques.				
	No. of viruses analysed by Sanger sequencing				**No. of viruses analysed by NGS**
	A(H1N1)pdm09	A(H3N2)	B/Vic	B/Yam	A(H3N2)
Australia	5	22	23	17	228
Cambodia	2	2			14
Macau SAR				1	
Malaysia		1		3	9
New Caledonia				1	
New Zealand		5	12	9	21
Philippines	1	1			1
Singapore	1				
Sri Lanka	2			1	1
South Africa		2		1	
Total	**11**	**33**	**35**	**33**	**274**

The year to date: surveillance results 1 January—31 October 2015

The results reported below are for viruses collected between 1 January and 31 October 2015 that have been analysed at the Centre as of 24 November 2015.

Virus types/subtypes†

The type and subtype/lineage of 2867 viruses have been determined. Amongst viruses analysed, the highest proportion of viruses was A(H3N2) (37.4%), followed by B/Yamagata (29.8%).

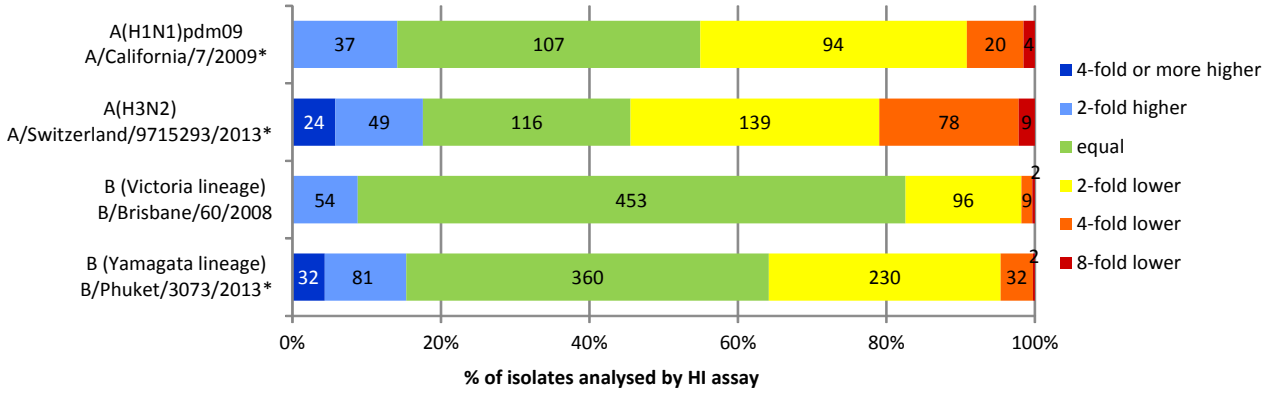


† *Subtypes and lineages are based on analysis of the HA and in some cases confirmed by genetic analysis of NA.*

^ *The Pacific region comprises countries in Polynesia, Melanesia and Micronesia.*

Antigenic analysis

Haemagglutination inhibition (HI) assays indicate that almost all A(H1N1)pdm09, A(H3N2), B/Victoria and B/Yamagata isolates were antigenically similar to the viruses recommended for the 2015 Southern Hemisphere vaccine. Assays using the 2016 Southern Hemisphere vaccine strains will be implemented in January 2016.

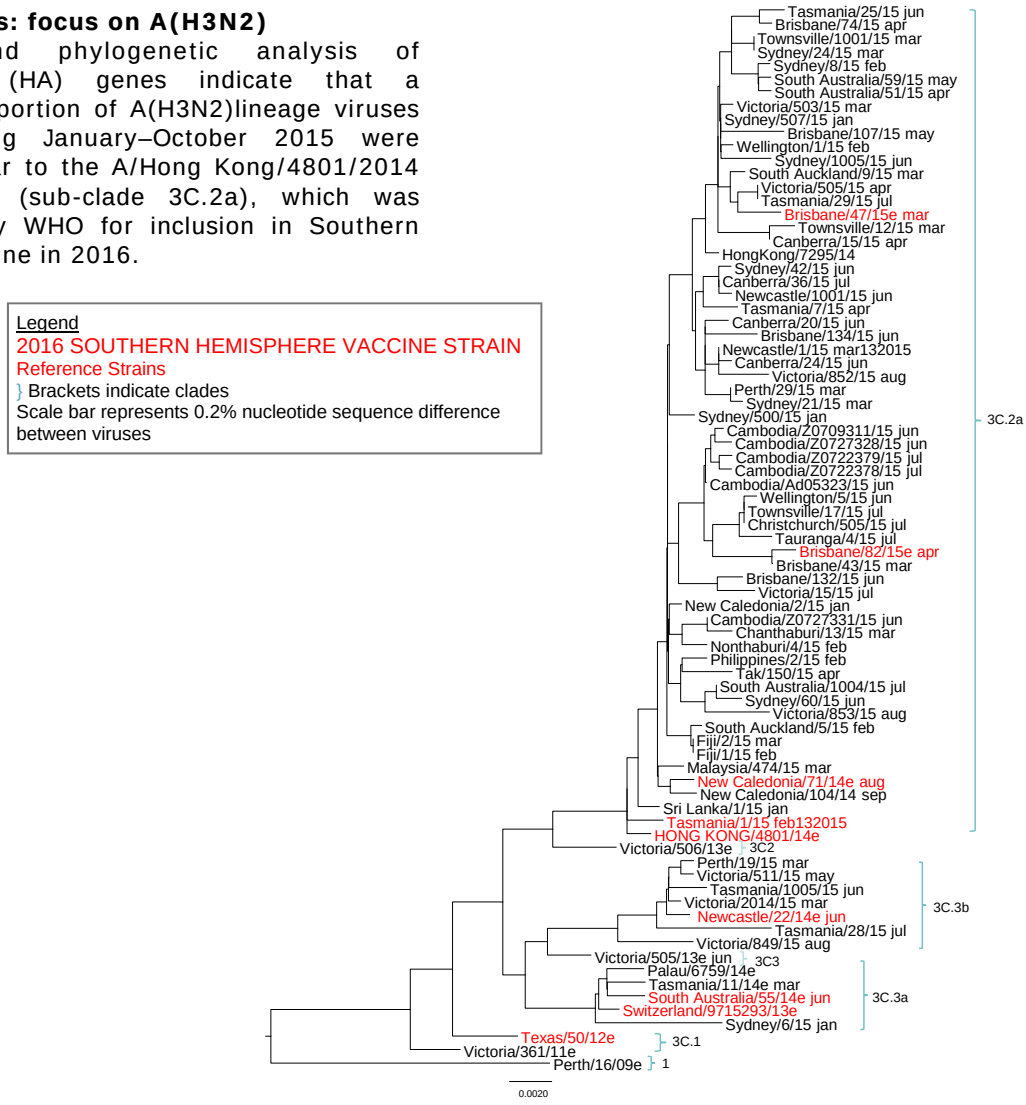


** indicates strains included in the 2015 Southern Hemisphere WHO vaccine recommendation.*

The year to date: surveillance results 1 Jan —31 Oct 2015 (continued)

Genetic analysis: focus on A(H3N2)

Sequencing and phylogenetic analysis of haemagglutinin (HA) genes indicate that a predominant proportion of A(H3N2)lineage viruses circulating during January–October 2015 were genetically similar to the A/Hong Kong/4801/2014 reference strain (sub-clade 3C.2a), which was recommended by WHO for inclusion in Southern Hemisphere vaccine in 2016.



Neuraminidase inhibitor susceptibility

Viral isolates are routinely tested for their susceptibility to the antiviral drugs oseltamivir (Tamiflu), zanamivir (Relenza), peramivir and laninamivir using the neuraminidase inhibition (NAI) assay. Of 1443 viruses tested, only one virus—from Brisbane—has shown highly reduced inhibition to peramivir.

Viruses that demonstrate reduced inhibition by antiviral drugs in the NAI assay undergo genetic analysis of the neuraminidase gene to detect known or novel mutations associated with the functional change. The relationship between reduced inhibition and the clinical effectiveness of a neuraminidase inhibitor is not well understood. Further studies would be required to determine whether a virus with reduced inhibition in the NAI assay is clinically resistant.

Type/subtype	A(H1N1)pdm09	A(H3N2)	B/Victoria	B/Yamagata	Mixed
No. viruses tested	196	611	203	432	1
Number of viruses with highly reduced inhibition					
Oseltamivir	0	0	0	0	0
Peramivir	0	0	0	1 (0.2%)	0
Zanamivir	0	0	0	0	0
Laninamivir	0	0	0	0	0

WHO Collaborating Centre for Reference and Research on Influenza
Peter Doherty Institute for Infection and Immunity
792 Elizabeth Street, Melbourne VIC 3000, Australia
ph: +61 3 9342 9300 Fax: +61 3 9342 9329
Email: whoflu@influenzacentre.org http://www.influenzacentre.org