Influenza Updates

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

Volume 6, Issue 2, August 2017

Upcoming: WHO Consultation on the Composition of Influenza Vaccines for the Southern Hemisphere 2018

We are pleased to announce that the upcoming WHO Consultation on the Composition of Influenza Vaccines for the Southern Hemisphere will be hosted by the Centre and held at the Peter Doherty Institute for Infection and Immunity in Melbourne on 25—27 September 2017. We look forward to hosting leaders and representatives from WHO, the other WHO Collaborating Centres for Influenza, the Essential Regulatory Laboratories, and other observers at the Consultation.

Please continue to send us your samples now, as this allows for them to be fully analysed in preparation for the Consultation. If you have any questions about shipping samples or would like information about accessing the WHO Shipping Fund for sending samples to a WHO Collaborating Centre, please contact us at *whoflu@influenzacentre.org*.

Australian Influenza Symposium

Registrations for the 12th Australian Influenza Symposium are now open. The Symposium will be held at the Peter Doherty Institute for Infection and Immunity in Melbourne on 1—2 November 2017. Confirmed speakers for the Symposium include:

Ben Cowling, The University of Hong Kong, Hong Kong SAR
Anice Lowen, Emory University, Atlanta GA, USA
Malik Peris, The University of Hong Kong, Hong Kong SAR
Omer Saad, Emory University, Atlanta GA, USA
Yuelong Shu, Sun Yat-Sen University, Guangzhou, China

You can register and find out more information about the Symposium via our website: http://www.influenzacentre.org/news_symposium.htm. In previous years the Symposium has been filled to capacity, so we recommend registering early to avoid disappointment. Please email us at *symposium@influenzacentre.org* if you have any further enquiries.

Australian Respiratory Virology Meeting

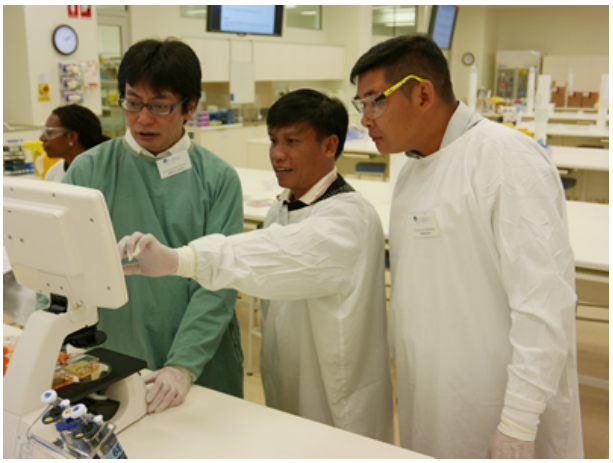
The Australian Respiratory Virology Meeting will be held directly following the Australian Influenza Symposium, at the Doherty Institute on 2-3 November 2017, and there will be a joint session on RSV for both meetings. Registrations will open on 1 September 2017. More information is available at our website: http://www.influenzacentre.org/news_respiratoryvirology.htm

WHO Collaborating Centre for Reference and Research on Influenza
VIDRL

Doherty Institute
A joint venture between the University of Melbourne and the Royal Melbourne Hospital

Workshop on Virus Isolation and Characterisation for National Influenza Centre Staff in the Western Pacific Region, 29 May — 2 June 2017

We were recently pleased to host scientists from National Influenza Centres in the WHO Western Pacific Region in for a week-long workshop on viral isolation and characterisation of influenza viruses. In total, 17 scientists from Australia, Cambodia, China, Fiji, Lao PDR, Malaysia, Mongolia, New Caledonia, New Zealand, Papua New Guinea, the Philippines, Singapore and Vietnam attended the workshop, which was held at the Doherty Centre. Staff from the Centre, Dr Kazuya Nakamura from the WHO Collaborating Centre for Reference and Research on Influenza in Japan and Dr Frank Konings from the WHO Office for the Western Pacific Region (WPRO) presented lectures and led laboratory practical sessions in techniques on cell culture and isolation of influenza viruses.



Recent activity at the Centre (1 May — 31 July 2017)

Below is a summary of surveillance activities at the Centre from 1 May to 31 July. These few months lead to our busiest time of the year as the Southern Hemisphere influenza season reaches its peak.

Samples received

The Centre received 1413 influenza samples from the laboratories and institutions listed below during the period 1 May—31 July, 2017.

AUSTRALIA: Royal Darwin Hospital, John Hunter Hospital, Westmead Hospital, Queensland Health Forensic and Scientific Services, SA Pathology, Hobart Pathology, Alfred Hospital, VIDRL, Pathwest QEII Medical Centre, Canberra Hospital, Royal Hobart Hospital, Australian Clinical Labs, Melbourne Pathology, Dorevitch Pathology, Monash Medical Centre, Royal Melbourne Hospital

CAMBODIA: Institut Pasteur du Cambodge

FIJI: Fiji Centre for Communicable Disease Control

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

PHILIPPINES: Research Institute for Tropical Medicine

SINGAPORE: National Public Health Laboratory

Genetic analysis: Sequencing was performed using a combination of Sanger sequencing and Next Generation Sequencing (NGS) techniques. In total, 723 HA, 633 NA, 524 MP and 108 NS genes were sequenced. These totals included 78 viruses which underwent full genome sequencing by NGS.

Country of submitting laboratory	No. of viruses with individual genes (HA/ NA/MP/NS) sequenced by Sanger sequencing or NGS.					No. of viruses analysed by full genome sequencing using NGS techniques.				
	A(H1N1)pdm09	A(H3N2)	B/Vic	B/Yam	Mixed (sub)type	A(H1N1)pdm09	A(H3N2)	B/Vic	B/Yam	Mixed (sub)type
Australia	66	447	18	31	1	11	16	5	7	
Cambodia							1	2	1	
Fiji		26		6		2	1	1	1	
Malaysia							1	3	1	
New Caledonia								1		
New Zealand	11	60	12	23		4	1		2	
Papua New Guinea						2			2	
Philippines	1	2		1			1	2	1	
Singapore			3							
South Africa	6							1		
Sri Lanka						1	2		1	1
Thailand	9	4	3	8		4	2	4	1	
Total	**93**	**539**	**36**	**69**	**1**	**24**	**25**	**19**	**17**	**1**

Isolation of viruses in eggs

The Centre undertakes primary isolation of selected viruses in eggs to obtain potential vaccine strains. From 1 May to 31 July 2017, 14 A(H3N2) viruses were successfully isolated in eggs at the Centre.

Recent activity at the Centre (1 May — 31 July 2017) (continued)

	Antigenic analysis: A total of 587 influenza isolates were analysed by HI assay.				**Neuraminidase inhibitor susceptibility:** A total of 930 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/Victoria	B/Yamagata	A(H1N1)pdm09	A(H3N2)	B/Victoria	B/Yamagata	Miexd (sub)type
Australia	96	143	12	60	109	339	9	84	1
Fiji		14		10		63		10	
New Zealand	21	43	3	86	22	62	3	86	
Philippines	1	1	3	1	1	2	3	1	
Singapore	14	32	8	7	25	33	8	10	
Sri Lanka					24				1
Thailand	7	6	10	9	7	7	10	10	
Total	**139**	**239**	**36**	**173**	**188**	**506**	**33**	**201**	**2**

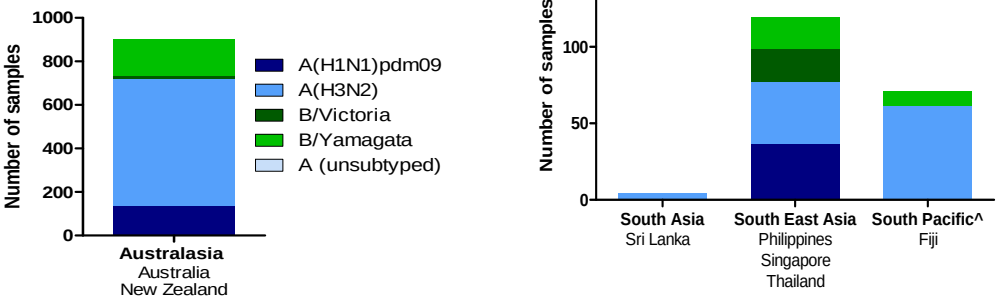
** Subtypes and lineages are based on analysis of HA and in some cases confirmed by genetic analysis of NA.*

Surveillance update: Virus activity 1 January—30 June 2017

The data below are results for viruses collected between 1 January and 30 June 2017 that have been analysed at the Centre as of 8 August 2017.

Virus types / subtypes†

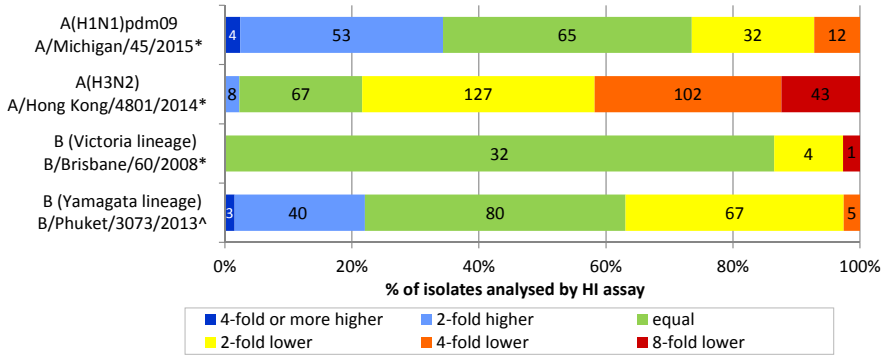
The type and subtype/lineage of 1096 viruses have been determined. The predominant type/subtype amongst viruses analysed to date is A(H3N2) (62.6%).



† Subtypes and lineages are based on analysis of the HA and in some cases confirmed by genetic analysis of NA.
^ The South Pacific region comprises countries in Polynesia, Melanesia and Micronesia.

Antigenic analysis

Haemagglutination inhibition (HI) assays indicate that with the exception of a small number of A(H3N2) viruses and one B/Victoria virus, all isolates were antigenically similar to the 2017 Southern Hemisphere and 2017-2018 Northern Hemisphere vaccine strains.



** indicates strains included in the 2017 Southern Hemisphere and 2017-2018 Northern Northern Hemisphere WHO vaccine recommendations.*
^ Indicates strains included in the WHO quadrivalent vaccine recommendations

Surveillance update 1 Jan —30 June 2017 (continued)

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. A total 1092 viruses were tested. One A(H1N1)pdm09 virus from Singapore showed highly reduced inhibition by oseltamivir and peramivir, and one A(H1N1)pdm09 virus showed highly reduced inhibition by zanamivir.

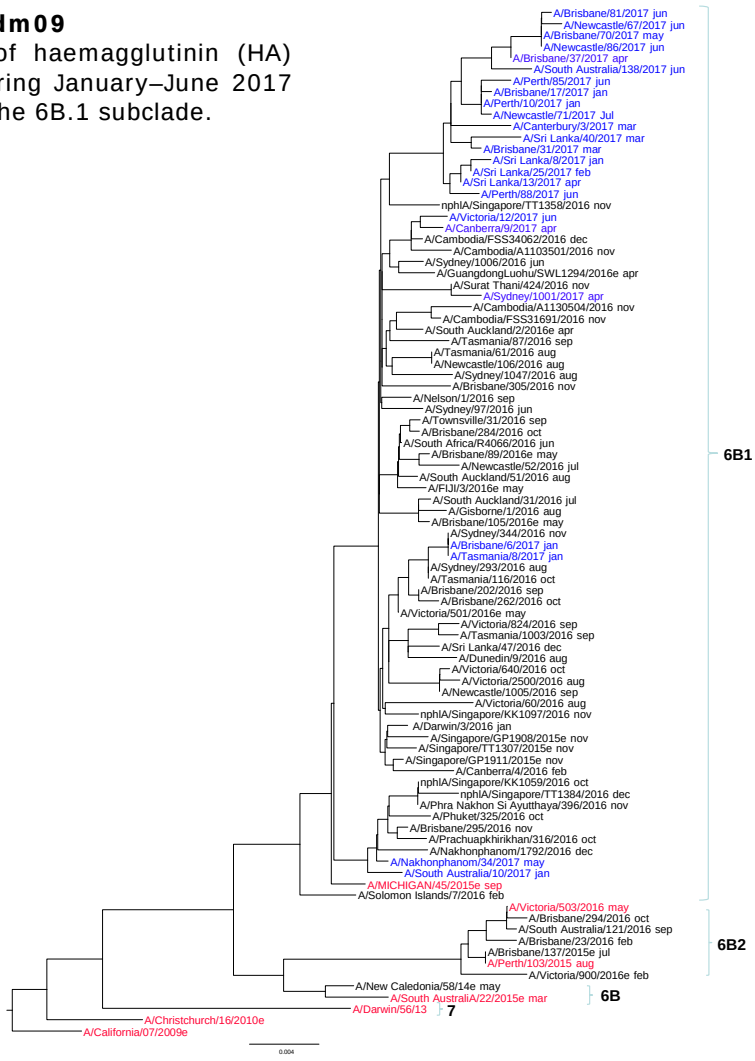
Viruses with reduced inhibition by antiviral drugs in the NAI assay undergo genetic analysis of the neuraminidase gene to detect mutations associated with the functional change. The relationship between reduced inhibition and the clinical effectiveness of a neuraminidase inhibitor is not well understood.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

Type/Subtype	No. tested	Oseltamivir		Peramivir		Laninamivir		Zanamivir	
		Reduced inhibition	Highly reduced inhibition	Reduced inhibition	Highly reduced inhibition	Reduced inhibition	Highly reduced inhibition	Reduced inhibition	Highly reduced inhibition
A(H1N1)pdm09	195		1 (0.5%)	1 (0.5%)	1 (0.5%)	1(0.5%)			1 (0.5%)
A(H3N2)	661								
B/Victoria	37	1 (2.7%)		1 (2.7%)				1 (2.7%)	
B/Yamagata	197								
Mixed (sub)type	2								
TOTAL	**1092**	**1 (0.09%)**	**1 (0.09%)**	**2 (0.18%)**	**1 (0.09%)**	**1 (0.09%)**	**0**	**1 (0.09%)**	**1 (0.09%)**

Genetic analysis: focus on A(H1N1)pdm09

Sequencing and phylogenetic analysis of haemagglutinin (HA) genes from A(H1N1)pdm09 collected during January–June 2017 show further evolution of the viruses in the 6B.1 subclade.

Legend
Reference strains
CURRENT VACCINE STRAIN
Viruses collected in 2017
} Brackets indicate clades
Scale bar represents 0.4% nucleotide sequence difference between viruses.
Amino acid changes are indicated.



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