

Influenza Updates

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

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WHO Recommendations for the Southern Hemisphere 2017 influenza vaccines

The WHO Consultation on the Composition of Influenza Vaccines for the Southern Hemisphere 2017 was held in Geneva, Switzerland on 26-28 September 2016. Following the Consultation, WHO made the following recommendation:

It is recommended that trivalent vaccines for use in the 2017 influenza season (southern hemisphere winter) contain the following:

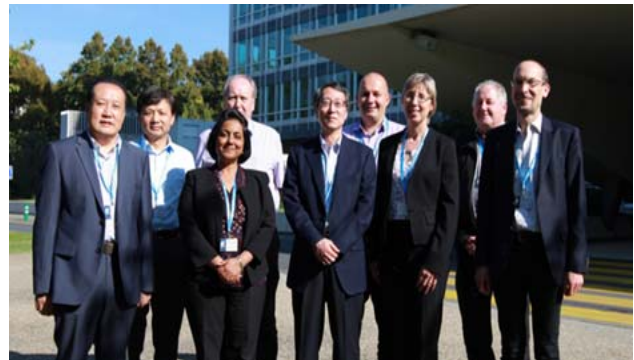
- an A/Michigan/45/2015 (H1N1)pdm09-like virus;
- an A/Hong Kong/4801/2014 (H3N2)-like virus;
- a B/Brisbane/60/2008-like virus.

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 is the first change in the A(H1N1)pdm09 component of the recommended vaccine composition since 2010. The change in recommendation was based on differences in the response of recent circulating viruses to human post-vaccination sera compared to the previous A(H1N1)pdm09 vaccine strain and a number of changes in the haemagglutinin protein that have occurred recently. More details can be found at:

http://www.who.int/influenza/vaccines/virus/recommendations/2017_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 to evolve, and the need for constant surveillance remains.



WHO temporary advisors attending the Consultation (photo courtesy of WHO)

Australian Influenza Symposium

As previously advised, the Australian Influenza Symposium will not be held in 2016 due to the similar timing of two major international meetings in August (Options IX for the Control of Influenza and the 16th International Congress of Immunology). The next Symposium is scheduled for October 2017. Please contact us at symposium@influenzacentre.org if you would like to stay informed about the 2017 Australian Influenza Symposium.



National Influenza Centres meeting in Bangkok

Six staff members from the Centre attended the 10th Bio-Regional Meeting of National Influenza Centres in the South-East Asia and Western Pacific Regions, held in Bangkok, Thailand in July (*pictured right*). Topics discussed included global and regional updates on influenza activity; progress of the five-year influenza strategy in the Asia-Pacific; quality control systems; antiviral resistance; epidemiology; implementation of the PIP Framework; strengthening reporting, virus tracking and data usage; and the influenza vaccination for pregnant women. We were pleased to catch up with many of you there and thank SEARO for organising the meeting.



WHO Consultation on National, Regional and Global Estimates of the Burden of Influenza Disease

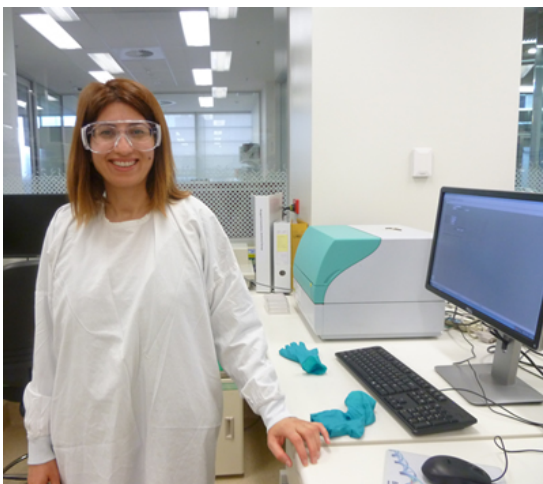
Ms Vivian Leung, epidemiologist from the Centre, and Dr James Fielding, epidemiologist from the Victorian Infectious Diseases Research Laboratory (VIDRL), attended the WHO Consultation on National, Regional and Global Estimates of the Burden of Influenza Disease, held in Geneva, Switzerland in July along with 106 other delegates from 53 countries (*pictured right*). The Consultation focused on reviewing influenza burden estimates from a number of countries and regions with a view to informing decisions about national influenza prevention and control programs, as well as identifying ways to improve the accuracy of national estimates. A scientific writing workshop led by Dr Fielding during the consultation focused on the presentation of influenza burden estimates in scientific journal articles.



WHO executive boardroom, Geneva, Switzerland

Visiting scientists

We were pleased to host Dr Sevim Mese (*pictured below*) from the National Influenza Reference Laboratory, Istanbul, Turkey from 21 June to 8 July. During her visit to the Centre, Dr Mese undertook training in testing viruses for resistance to antiviral drugs.



We welcome Dr Daniil Korenkov (*pictured below*), a research collaborator from the Institute of Experimental Medicine, St Petersburg, Russia. Dr Korenkov will be at the Centre from September 2016 to March 2017, during which time he will assess the immunological and protective properties of a prototypical Live Attenuated Influenza Vaccine (LAIV) in *in vitro* and *in vivo* models.





Recent activity at the Centre (1 April – 30 September 2016)

Below is a summary of surveillance activities at the Centre from 1 April to 30 September. This period represents the busiest time of the year for the Centre as it coincides with the Southern Hemisphere influenza season.

Samples received

The Centre received 2624 influenza samples from the laboratories and institutions listed below during the period 1 April–30 September, 2016.

AUSTRALIA: Canberra Hospital, Royal Darwin Hospital, John Hunter Hospital, Westmead Hospital, Queensland Health Forensic and Scientific Services, SA Pathology, Royal Hobart Hospital, Austin Health, Melbourne Pathology, Alfred Hospital, Monash Medical Centre, Royal Children's Hospital (Molecular Microbiology Dept.), Royal Melbourne Hospital, St Vincent's Hospital Melbourne, VIDRL, Pathwest QEII Medical Centre,

CAMBODIA: Institut Pasteur du Cambodge

FIJI: Fiji Centre for Communicable Disease Control

MALAYSIA: Institute for Medical Research

MACAU SAR: Public Health Laboratory

NEW CALEDONIA: Institut Pasteur

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

PHILIPPINES: Research Institute for Tropical Medicine

SINGAPORE: National Public Health Laboratory

SOLOMON ISLANDS: National Referral Hospital

SOUTH AFRICA: National Institute for Communicable Disease

SRI LANKA: Medical Research Institute

THAILAND: Thai National Influenza Center

VIETNAM: National Institute of Hygiene and Epidemiology

	Antigenic analysis: A total of 1523 influenza isolates were analysed by HI assay.					Neuraminidase inhibitor susceptibility: A total of 1928 influenza isolates were tested by neuraminidase inhibition (NAI) assay for susceptibility to oseltamivir, zanamivir, peramivir and laninamivir.				
Country of submitting laboratory	No. of viruses analysed by HI assay*					No. of viruses tested by NAI assay*				
	A(H1N1) pdm09	A(H3N2)	A (Mixed subtype)	B/Victoria	B/Yamagata	A(H1N1) pdm09	A(H3N2)	A (Mixed subtype)	B/Victoria	B/Yamagata
Australia	507	292	1	44	44	477	645	2	43	46
Cambodia	37			10	4	37	1		10	3
Fiji	25			7	1	24	30		7	1
Macau	20			4		20	1		4	
Malaysia	35	11		18	23	35	23	1	18	23
New Caledonia	27	3		7		27	29		7	
New Zealand	40	85		12	9	40	86		11	13
Philippines	8			2	2	8			2	2
Singapore	50	30		31	30	48	46		31	30
Solomon Islands	17									
South Africa	3	7		13		3	10		13	
Sri Lanka	7	1		5		7	3		4	
Thailand	7			7		7	3		7	
Vietnam	13	19		2	3	13	22		2	3
Total	796	448	1	162	116	746	899	3	159	121

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



Recent activity at the Centre (1 Apr – 30 Sept 2016, continued)

	Genetic analysis: Sanger sequencing was performed on 160 HA, 163 NA, 85 MP and 24 NS genes from 156 viruses. Next Generation Sequencing (NGS) techniques were used to sequenced the HA, NA and MP genes of an additional 208 viruses. In total, 2375 sequences from 825 human viruses received for surveillance purposes were deposited with the GISAID EpiFlu™ database (http://www.gisaid.org).								
Country of submitting laboratory	No. of viruses with individual genes (HA/NA/MP/NS) analysed by Sanger sequencing					No. of viruses analysed using NGS techniques (HA/NA/MP)			
	A(H1N1) pdm09	A(H3N2)	B/Vic	B/Yam	Mixed	A(H1N1) pdm09	A (H3N2)	B/Vic	B/Yam
Australia	48	22	14	11	1	57	72	13	8
Cambodia	3		1						
Fiji	9	1	1						
Macau SAR			1						
Malaysia	5	1	2	3		2		3	1
New Caledonia	3						18	4	
New Zealand	5	15	2	1		6	13	2	3
Solomon						2			
South Africa	1	1					4		
Sri Lanka	2								
Thailand	1								
Vietnam				2					
Total	77	40	21	17	1	67	107	22	12

Isolation of viruses in eggs

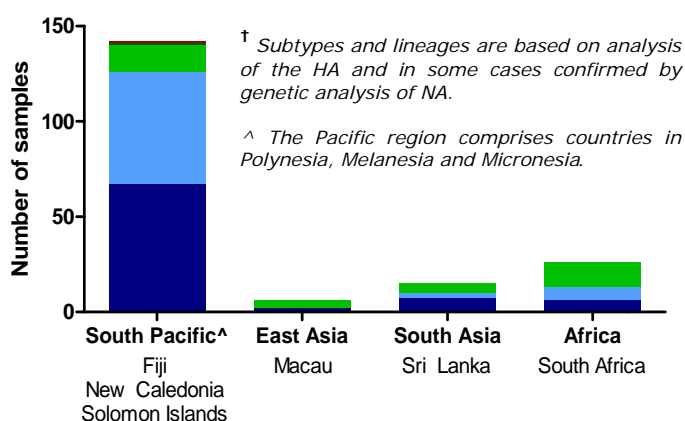
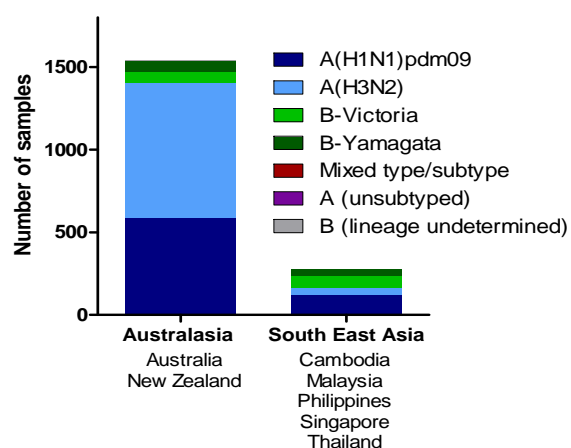
The Centre undertakes primary isolation of selected viruses in eggs to obtain potential vaccine strains. From 1 April to 30 September 2016, 14 A(H1N1)pdm09, 8 A(H3N2) and 4 B/Victoria viruses were successfully isolated in eggs at the Centre.

Surveillance update: Virus activity 1 January–30 September 2016

The data below are results for viruses collected between 1 January and 30 September 2016 that have been analysed at the Centre as of 4 October 2016.

Virus types/subtypes[†]

The type and subtype/lineage of 2003 viruses have been determined. The predominant type/subtype amongst viruses analysed to date was A(H3N2) (46.7%).



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

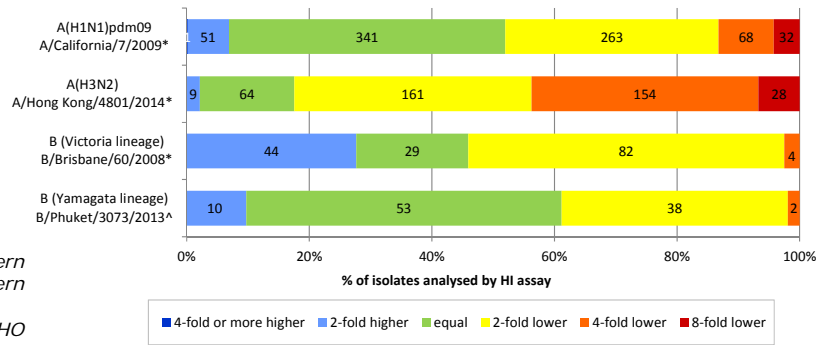
[^] The Pacific region comprises countries in Polynesia, Melanesia and Micronesia.



Surveillance update: Virus activity 1 Jan – 30 Sept 2016 (continued)

Antigenic analysis

Haemagglutination inhibition (HI) assays indicate that with the majority of isolates were antigenically similar to the 2016 Southern Hemisphere and 2016-2017 Northern Hemisphere vaccine strains.



* indicates strains included in the 2016 Southern Hemisphere and 2016-2017 Northern Hemisphere WHO vaccine recommendations.

^ Indicates strains included in the WHO quadrivalent vaccine recommendations

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

Genetic analysis: focus on A(H1N1)pdm09

Sequencing and phylogenetic analysis of haemagglutinin (HA) genes indicate that during January-September 2016 an increasing number of circulating viruses fell into clade 6B.1, which is the same clade as the new A(H1N1)pdm09 vaccine strain A/Michigan/45/2016.



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 1886 viruses tested, three A(H1N1)pdm09 viruses (from Queensland, New South Wales and Victoria) showed highly reduced inhibition to oseltamivir and permivir, whilst one B/Victoria virus from Malaysia showed highly reduced inhibition to all four neuraminidase inhibitors.

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	A (Mixed subtype)
No. viruses tested	764	853	158	109	2
Number of viruses with highly reduced inhibition					
Oseltamivir	3	0	1	0	0
Peramivir	3	0	1	0	0
Zanamivir	0	0	1	0	0
Laninamivir	0	0	1	0	0

Previous editions of this newsletter can be found at: http://www.influenzacentre.org/centre_reports.htm