Influenza Updates

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

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Preparation for the Southern Hemisphere influenza season

As winter and the influenza season approach in the Southern Hemisphere, we expect that the number of samples submitted to the Centre will increase in the coming months in the lead up to the next WHO Consultation on the Composition of Influenza Vaccines for the Southern Hemisphere on 21-23 September 2015.

Please send us your samples on a regular basis as soon as possible after collection, as they are most useful when they have been collected recently—we accept both viral isolates and/or original clinical specimens. We need to receive samples by the end of August in order to process them in time for the Consultation.

The WHO Shipping Fund Project covers the cost of shipping samples by National Influenza Laboratories to WHO Collaborating Centres for up to a maximum of 3 shipments per laboratory per year. If you have any questions about shipping samples or would like information about accessing the WHO Shipping Fund, please contact us at *whoflu@influenzacentre.org*.

Timing for sending samples to a WHOC Collaborating Centre

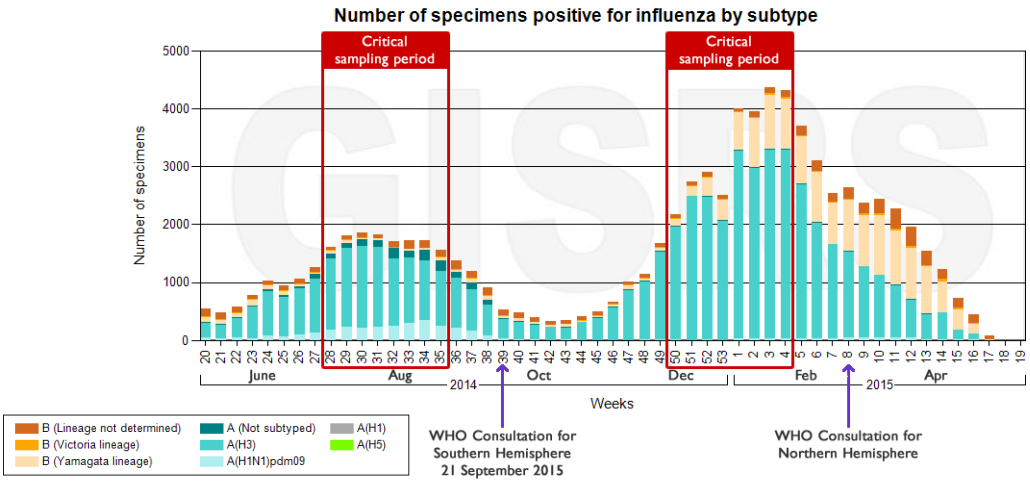


Figure adapted from FluNet: http://www.who.int/influenza/gisrs_laboratory/flunet/en/; circulation of influenza viruses, Western Pacific Region of WHO

A new appointment for the Centre's Director

The Centre's Director, Professor Anne Kelso (pictured) took up a new position as the Chief Executive Officer of the National Health and Medical Research Council (NHMRC) in late April 2015. The NHMRC is the primary Australian Government organisation responsible for providing health and medical research funding and developing health advice and guidelines. We wish Professor Kelso the very best in her new position and thank her for her leadership and service to the Centre, as well as her contribution to the global influenza surveillance community during the past 8 years. The process for appointing a new Centre Director is in the early stages. In the interim Dr Ian Barr will be Acting Director of the Centre.

WHO Collaborating Centre for Reference and Research on Influenza
VIDRL

Protocols and primers for sequencing of influenza A viruses

The Centre recently published a paper describing a simple and streamlined method for sequencing the full genome of influenza A viruses using Sanger sequencing. The paper, which contains full details of the method and primer sequences used, is freely accessible:

> Deng YM, Spirason N, Iannello P, Jelley L, Lau H and Barr IG. A simplified Sanger sequencing method for full genome sequencing of multiple subtypes of human influenza A viruses. J Clin Virol. DOI: 10.1016/j.jcv.2015.04.019
> http://www.journalofclinicalvirology.com/article/S1386-6532(15)00131-6/fulltext

Australian Influenza Symposium

The 11th Australian Influenza Symposium will be held on Monday 12 October and Tuesday 13 October at Deakin University Waterfront Campus, Geelong, Victoria. Attendance at the Symposium is free to those who register, online registration details will be available mid-year. Please note that attendee numbers are restricted this year due to the size limits of the venue, so prompt registration is recommended to secure a place.

Symposium updates are available at http://www.influenzacentre.org/news_symposium.htm.
Please email us at symposium@influenzacentre.org if you wish to be notified when registrations open or if you have any further enquiries.

Upcoming meetings and conferences

Look out for staff from our Centre who will be attending and presenting posters and talks at the following meetings during 2015. Please contact us if you would like to meet us there.

isirv Workshop on Next Generation Sequencing of Viruses
20–21 May 2015; Paris, France
http://www.isirv.org/site/index.php/component/content/article/9-events/270-ngs-workshop-programme
This workshop will include discussions of next generation sequencing (NGS) technologies, data processing and analysis, interpretation of data and use of NGS data, with a view to providing guidance for the use and interpretation of NGS data on viruses in public health.

Communicable Disease Control Conference
1–2 June 2015; Brisbane, Australia
https://phaa.eventsair.com/QuickEventWebsitePortal/cdc2015/cdcwebsite/Agenda
Organised by the Public Health Association of Australia, this conference will examine various aspects of communicable disease control, with particular focus on Indigenous populations and other vulnerable groups.

Fourth isirv Antiviral Group Conference - Novel Antiviral Therapies for Influenza and Other Respiratory Viruses: Bench to Bedside
2–4 June 2015; Austin TX, USA
http://www.isirv.org/site/index.php/special-interest-groups/antiviral-group-home/9-events/233-4th-isirv-avg-conference
This conference will focus on pre-clinical and clinical development of new antiviral treatments against influenza and other respiratory viruses.

2nd Asia-Pacific Influenza Summit and Antiviral Forum
10–11 June 2015; Hanoi, Vietnam
http://www.apaci.asia/activities/apaci-meetings/2nd-asia-pacific-influenza-summit-2015
http://www.apaci.asia/activities/apaci-meetings/2nd-asia-pacific-antiviral-forum-2015
These meetings are organized by the Asia-Pacific Alliance for the Control of Influenza, and will provide an opportunity for discussion of issues and initiatives related to influenza and antiviral treatments in the Asia-Pacific region.

1st International Meeting on Respiratory Pathogens
2–4 September 2015; Singapore
http://www.isirv.org/site/index.php/component/content/article/9-events/234-1st-international-meeting-on-respiratory-pathogens
This meeting aims to address the burden caused by respiratory viruses, bacteria and other pathogens. It is anticipated that the discussion of recent advances in epidemiology, immunology, diagnostics, vaccines, therapeutics and clinical management will help to inform health policy initiatives that reduce the burden of such diseases.

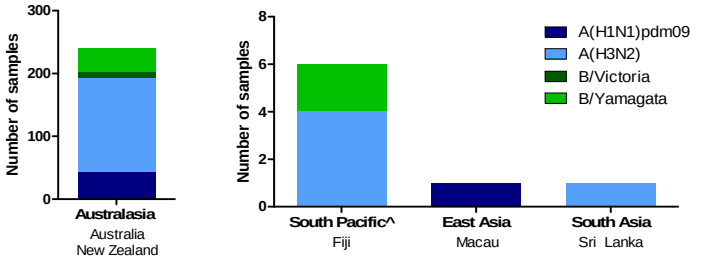
Surveillance update: Virus activity 1 January—31 March 2015

The data below are results for viruses collected between 1 January and 31 March 2015 that have been analysed at the Centre as of 6 May 2015.

Virus types/subtypes†

The type and subtype/lineage of 249 viruses have been determined. The predominant type/subtype amongst viruses analysed to date was A(H3N2)(61.8%).

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

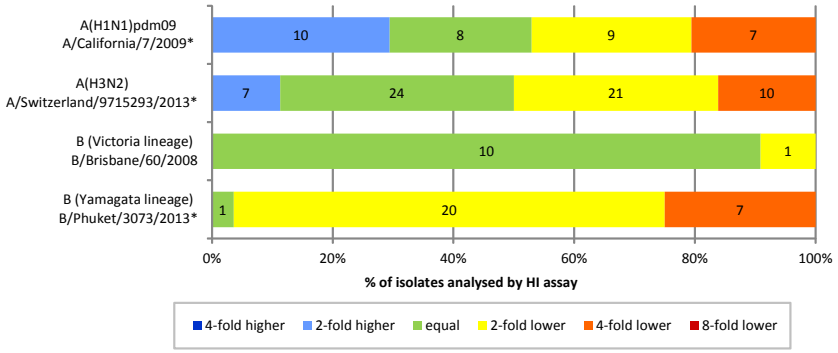


^ *The Pacific region comprises countries in Polynesia, Melanesia and Micronesia.*

Antigenic analysis

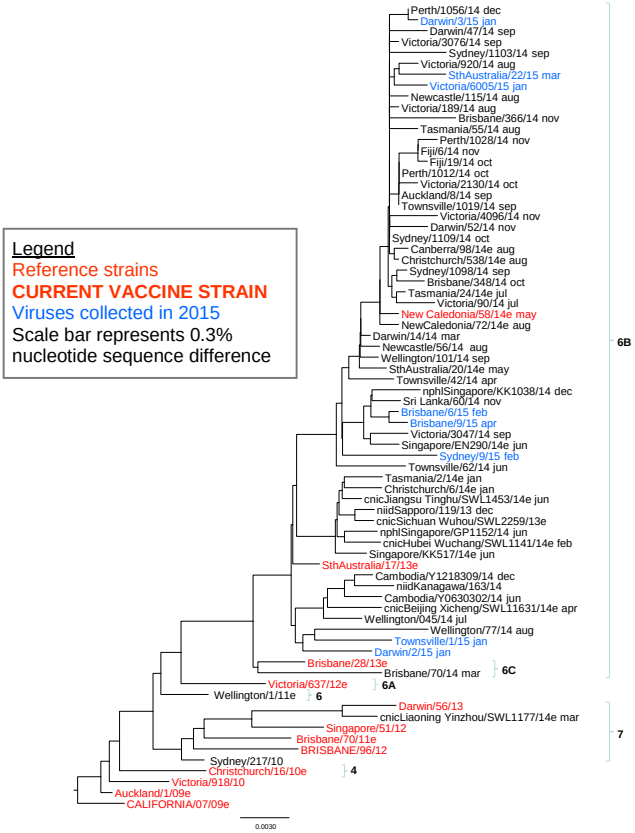
Haemagglutination inhibition (HI) assays indicate that all A(H1N1) pdm9, A(H3N2), B/Victoria and B/Yamagata isolates were antigenically similar to the 2015-2016 Northern Hemisphere vaccine strains.

** indicates strains included in the 2015-2016 Northern Hemisphere WHO vaccine recommendation.*



Genetic analysis: focus on A(H1N1)pdm9

Sequencing and phylogenetic analysis of haemagglutinin (HA) genes indicate that viruses circulating during January-March 2015 contained some genetic changes compared to the vaccine reference strain A/California/7/2009, although these changes do not affect the antigenic behaviour of the viruses.



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 189 viruses tested, only one virus showed highly reduced inhibition by 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) pdm9	A(H3N2)	B/ Victoria	B/ Yamagata
No. viruses tested	34	115	11	29
Number of viruses with highly reduced inhibition				
Oseltamivir	0	0	0	0
Peramivir	0	0	0	1 (3.4%)
Zanamivir	0	0	0	0
Laninamivir	0	0	0	0

Recent activity at the Centre (1 January — 30 April 2015)

Below is a summary of surveillance activities at the Centre from 1 January to 30 April. We anticipate that the next few months will be an increasingly busy time for the Centre as the Southern Hemisphere influenza season commences.

Samples received

The Centre received 820 influenza samples from the laboratories and institutions listed below during the period 1 January—3 April, 2015.

AUSTRALIA: Canberra Hospital, John Hunter Hospital, Prince of Wales Hospital, Westmead Hospital, Royal Darwin Hospital, Queensland Health Forensic and Scientific Services, SA Pathology, Royal Hobart Hospital, Melbourne Pathology, Austin Health, Monash Medical Centre, Alfred Hospital, Royal Children's Hospital (Molecular Microbiology Department (Bio21)), VIDRL, PathWest QEII Medical Centre

CAMBODIA: Institut Pasteur du Cambodge

FIJI: Fiji Centre for Communicable Disease Control

MACAU: Public Health Laboratory

PHILIPPINES: Research Institute for Tropical Medicine

SINGAPORE: National Public Health Laboratory

SRI LANKA: Medical Research Institute

VIETNAM: Institut Pasteur in Ho Chi Minh City

	Antigenic analysis: A total of 487 influenza isolates were analysed by HI assay.				**Genetic analysis:** Sequencing was performed on 504 HA, 474 NA, 369 MP and 144 NS genes from 525 viruses. In total, 283 sequences from 96 human viruses were deposited with the GISAID EpiFlu™ database (http://www.gisaid.org).				**Neuraminidase inhibitor susceptibility:** A total of 439 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 with gene sequences deposited with GISAID**				**No. of viruses tested by NAI assay**			
	A(H1N1) pdm9	A(H3N2)	B/Vic	B/Yam	A(H1N1) pdm9	A(H3N2)	B/Vic	B/Yam	A(H1N1) pdm9	A(H3N2)	B/Vic	B/Yam
Australia	45	98	19	55	15	19	8	8	38	85	12	31
Cambodia	1	31		5	1			3	1	34		5
Fiji	14	2		2	3			1	18	1		2
Macau SAR	14	24		2			3		9			
Malaysia					2	1						
New Caledonia		21		8	2	4	3	5	2	22	1	4
New Zealand					4							
Philippines		1		9	3	2	1	1		1		9
Singapore	27	4	2	37					27	52	2	37
Solomon Islands		3				2				11		
South Africa					1							
Sri Lanka	3	11		1	1	1		1	3	22		1
Thailand						1						
Vietnam		7	1	4								
Total	**104**	**238**	**22**	**123**	**32**	**30**	**15**	**19**	**98**	**237**	**15**	**89**

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

Isolation of viruses in eggs

The Centre undertakes primary isolation of selected viruses in eggs to obtain potential vaccine strains. From 1 January to 3 April 2015, 2 A(H1N1)pdm9, 7 A(H3N2), 2 B/Victoria and 2 B/Yamagata viruses have been successfully isolated in eggs at the Centre.

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