Influenza Updates

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

Volume 1, Issue 1, August 2012

News and Events

Welcome to the Centre newsletter

We are pleased to launch "Influenza Updates", a periodic newsletter that will report on work at the Centre and provide an overview of how samples submitted by National Influenza Centres and other laboratories contribute to the WHO Global Influenza Surveillance and Response System (GISRS). We will also report on events and activities related to influenza surveillance and research, both within the Centre and in the broader influenza community. We hope you will find this newsletter both useful and interesting, and we welcome your feedback!

Call for influenza samples

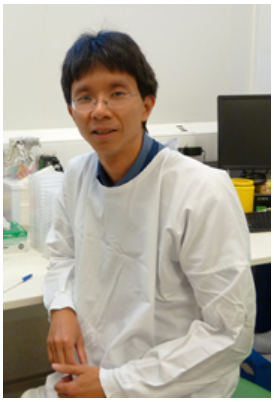
The WHO Consultation on the Composition of Influenza Vaccines for the Southern Hemisphere 2013 will be held in Beijing on 17-20 September. In preparation for the Consultation, we encourage all submitting laboratories to send your influenza samples to us as soon as possible. Analysis of viruses may take a few weeks and your samples are most useful to WHO GISRS surveillance and vaccine formulation if they can be analysed before the Consultation.

If possible we prefer to receive viral isolates. However, we will also accept original clinical specimens in a timely manner prior to the Consultation. Please contact us at *whoflu@influenzacentre.org* if you have any questions about shipping samples.

Reporting of influenza sequences to GISAID EpiFlu™ database

In the near future we will be providing a new report to submitting laboratories on influenza viruses analysed at the Centre that will notify you if gene sequences from samples that you have sent to us are deposited in the freely accessible GISAID EpiFlu™ database (http://www.gisaid.org). This is in addition to HI assay and NAI assay results that we currently provide following sample analysis.

In profile: Jamal I-Ching Sam



The Centre was pleased to host Associate Professor Jamal I-Ching Sam (pictured right), from the NIC and Tropical Infectious Diseases Research and Education Centre at the University of Malaya, from February to May 2012. Jamal is responsible for operation of the diagnostic virology laboratory at University Malaya Medical Centre. His research interests include the clinical and molecular epidemiology of respiratory viruses, and the burden of influenza.

During his time at the Centre in Melbourne, Jamal re-isolated influenza strains collected at the University of Malaya from 1995 to 2009, tested the susceptibility of these isolates to neuraminidase inhibitors and conducted a seroprevalence study of pre- and post-pandemic influenza samples from Malaysia. He says "I very much enjoyed my time at the Centre, especially the warmth, generosity and professionalism of the people. My attachment has been one of the highlights of my career so far."

WHO Collaborating Centre for Reference and Research on Influenza
VIDRL

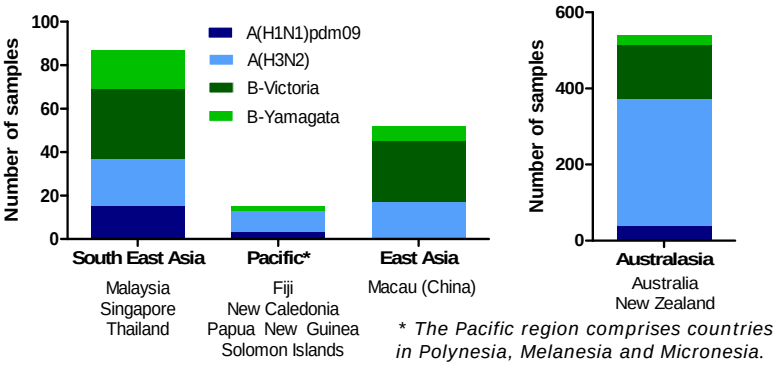
Surveillance update: Virus activity 1 January-30 June 2012

The data reported here describes results for viruses with collection dates in the period 1 January to 30 June 2012 that have been analysed at the Centre as of 7 August, 2012.

Virus types/subtypes†

The type and subtype/lineage of 694 viruses have been determined. The majority of viruses were A(H3N2) [193 viruses] or Influenza B (Victoria lineage) [154 viruses]. Of samples sent to the Centre by non-Australasian laboratories, 39% of viruses are Influenza B (Victoria lineage), mostly from South East Asia and East Asia.

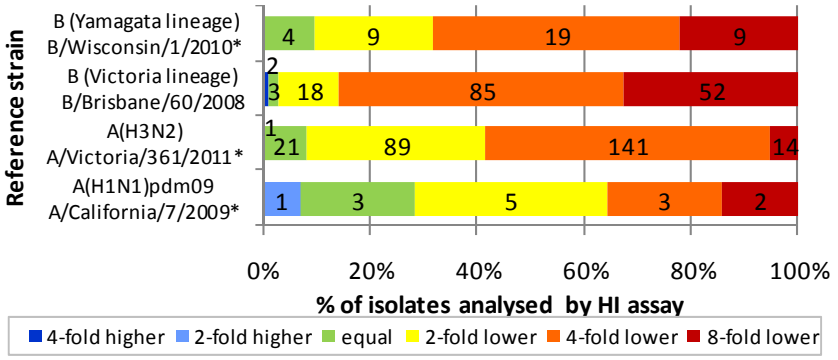
† *Subtypes and lineages are based on analysis of the HA and in some cases confirmed by genetic analysis of NA.*



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

Antigenic analysis

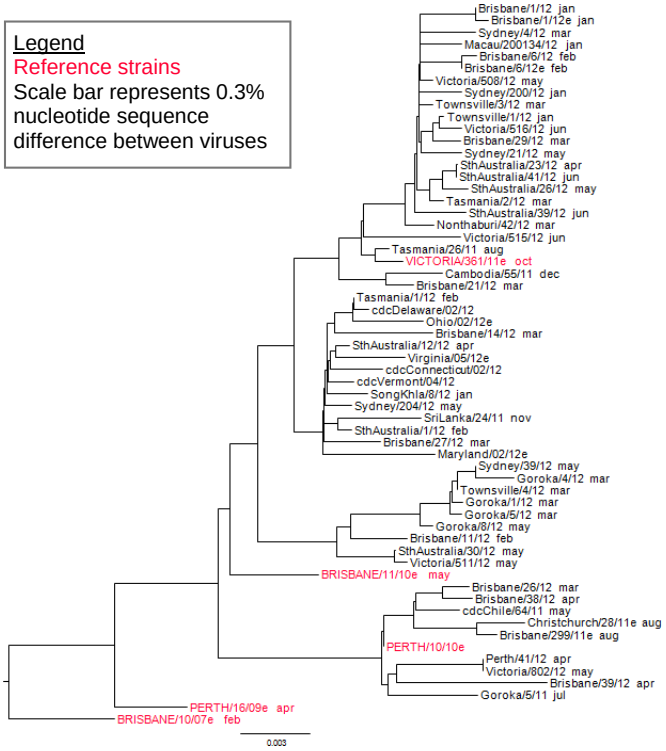
Haemagglutination inhibition (HI) assays indicate that most isolates are antigenically similar to current vaccine strains, with a minority of low reactors (8-fold lower HI titres compared to reference strains). Detection of low reactors with specific antisera may be due to several different factors, so further analyses are performed to determine whether antigenic drift has occurred.



** indicates strains included in the most recent WHO vaccine recommendation (2012-2013 Northern Hemisphere)*

Genetic analysis: focus on A(H3N2)

Sequencing and phylogenetic analysis of haemagglutinin (HA) genes indicate that the majority of A(H3N2) viruses circulating during January-June 2012 are genetically similar to A/Victoria/361/2011.



Neuraminidase inhibitor resistance

Viruses are routinely tested for their sensitivity to the antiviral drugs oseltamivir (Tamiflu) and zanamivir (Relenza) using the neuraminidase inhibitor (NAI) assay.

Of 524 viruses tested, only one, a A(H1N1) pdm09 virus from Perth, was found to have highly reduced sensitivity to oseltamivir. This virus was confirmed to carry the H275Y mutation in the NA protein that confers resistance to oseltamivir. All viruses tested are sensitive to zanamivir (data not shown).

Viruses tested for resistance to oseltamivir		
	No. sensitive viruses	No. resistant viruses
A(H1N1)pdm09	26	1 (3.7%)
A(H3N2)	278	0
B	219	0

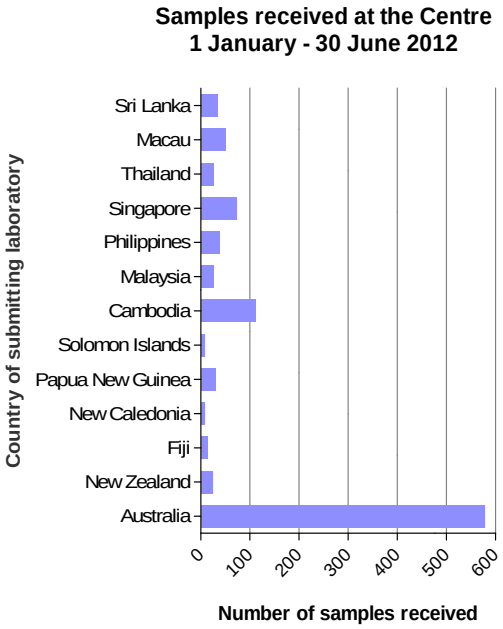
Recent activity at the Centre (1 May—30 June 2012)

The onset of winter in the southern hemisphere marks the start of a busy period at the Centre. Below is a summary of our surveillance activities during the period 1 May to 30 June.

Samples received

The Centre received a total of 440 samples from the laboratories listed below. This brings the total number of samples received by the Centre in the first half of 2012 (January-June) to 1016 (see graph at right).

<u>Submitting laboratories 1 May to 30 June:</u>
IMVS Pathology (Adelaide, Australia)
Queensland Health Forensic and Scientific Services (Brisbane, Australia)
Canberra Hospital (Canberra. Australia)
Royal Darwin Hospital (Darwin, Australia)
Royal Hobart Hospital (Hobart, Australia)
Austin Health (Melbourne, Australia)
Monash Medical Centre (Melbourne, Australia)
Royal Children's Hospital (Melbourne, Australia)
VIDRL (Melbourne, Australia)
PathWest QEII Medical Centre (Perth, Australia)
Prince of Wales Hospital (Sydney, Australia)
Westmead Hospital (Sydney, Australia)
Institute for Medical Research (Kuala Lumpur, Malaysia)
Institute Pasteur (Noumea, New Caledonia)
Institute of Medical Research (Goroka, Papua New Guinea)



Antigenic analysis

A total of 277 influenza isolates submitted from 6 countries were analysed by HI assay.

Country of submitting laboratories	Number of viruses analysed by HI assay*			
	A(H1N1) pdm09	A(H3N2)	B Victoria	B Yamagata
Australia	11	125	80	11
New Zealand	4			
Malaysia		1	10	
Thailand	1	6	14	4
Papua New Guinea	5	2		
Macau			1	
Total	21	134	105	15

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

Neuraminidase inhibitor resistance

A total of 268 influenza isolates were tested by neuraminidase inhibition (NAI) assay for susceptibility to the antiviral drugs oseltamivir and zanamivir.

Country of submitting laboratories	Number of viruses tested by NAI assay		
	A(H1N1)pdm09	A(H3N2)	B
Australia	8	133	100
Malaysia		1	13
Papua New Guinea	6	3	1
Philippines			1
Thailand	1		1
TOTAL	15	137	116

Genetic analysis

Sequencing was performed on 81 HA, 82 NA, 46 MP and 49 NS genes. A total of 290 gene sequences from 100 viruses were deposited with the GISAID EpiFlu™ database (http://www.gisaid.org) by the Centre.

Country of submitting laboratories	Number of viruses with gene sequences deposited with GISAID		
	A(H1N1) pdm09	A(H3N2)	B
Australia	5	18	21
New Zealand	2		4
Fiji	4		2
Solomon Islands			1
Cambodia	5	4	4
Philippines		2	8
Singapore	2		7
Macau		1	4
Sri Lanka	2	1	3
TOTAL	20	26	54

Isolation of viruses in eggs

The Centre undertakes primary isolation of selected viruses into eggs to obtain potential vaccine strains. From 1 May to 30 June, 4 A(H3N2) viruses and 1 B virus were successfully isolated in eggs at the Centre.

Influenza research community

Australian Influenza Symposium

The 8th Australian Influenza Symposium will held on 4-5 October 2012 at the John Curtin School of Medical Research, Australian National University, Canberra. We are pleased to confirm an exciting and diverse line-up of international speakers, including:

Dr Danuta Skowronski, British Columbia Centre for Disease Control, Vancouver, Canada
Prof Ralph Tripp, The University of Georgia College of Veterinary Medicine, Georgia, USA
Assoc/Prof S Mark Thompkins, Influenza Pathogenesis & Immunology Research Center, University of Georgia College of Veterinary Medicine, Georgia, USA
Dr Philippe Buchy, Institut Pasteur in Cambodia, Phnom Penh, Cambodia
Prof Eddie Holmes, Pennsylvania State University, USA/University of Sydney, Australia

Please contact us by email at *whoflu@influenzacentre.org* if you wish to receive more information about the 2012 Symposium.

Recent publications of interest: Influenza surveillance and epidemiology

Each newsletter we will highlight recent publications related to a particular theme.

Members of the Western Pacific Region Global Influenza Surveillance and Response System. (2012) Epidemiological and virological characteristics of influenza in the Western Pacific Region of the World Health Organization, 2006-2010. PLoS One, 7(5): e37568.
A comprehensive study and review of influenza-like illness (ILI) and the circulation of influenza viruses in the Western Pacific region during a 5 year period, based on surveillance data from 14 countries ranging from Mongolia in the north to New Zealand in the south.

WHO Writing Group, Ampofo WK, Baylor N, *et al.* Improving influenza vaccine virus selection: report of a WHO informal consultation held at WHO headquarters, Geneva, Switzerland, 14-16 June 2010. Influenza Other Respi Viruses. 2012 Mar;6(2):142-52, e1-5.
An overview of WHO GISRS activities, the role of participating laboratories and the processes leading to vaccine virus selection.

Van Kerkhove MD, Vandemaele KA, *et al.* WHO Working Group for Risk Factors for Severe H1N1pdm Infection. Risk factors for severe outcomes following 2009 influenza A (H1N1) infection: a global pooled analysis. PLoS Med. 2011 Jul;8(7):e1001053.
Analysis of risk factors for severe outcomes from A(H1N1)pdm09 influenza based on data collected from 19 different countries.

Upcoming meetings and conferences

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

Incidence, Severity, and Impact 2012
5-8 September 2012; Munich, Germany
http://www.controlinfluenza.com/incidence-severity-and-impact-2012/overview/
Conference run by the International Society for Influenza and other Respiratory Virus Diseases (isirv), focusing on seasonal and pandemic influenza.

Influenza 2012: One Influenza, One World
11-13 September 2012; Oxford, UK
http://www.lpmhealthcare.com/Influenza2012/InfluenzaHome.htm
Research conference on zoonotic and human influenza.

6th Orthomyxovirus Research Conference
19-22 September 2012; Quebec, Canada
http://www.orthomyxovirus2012.org/en/
Research meeting focusing on aspects of pandemic preparedness.

WHO Consultation and Information Meeting on the Composition of Influenza Virus Vaccines for the Southern Hemisphere 2013
17-20 September; Beijing, China
The Director and Deputy Director of the Centre will attend the Consultation.

Severe Influenza: Burden, Pathogenesis and Management
29-31 October 2012; Hanoi, Vietnam
http://www.isirv.org/site/index.php/component/content/article/11-antiviral-group/167-second-avg-conference
Run by the Antiviral Group of isirv, this conference will focus on severe influenza, including epidemiology, mechanisms of pathogenesis, treatment and resistance to antiviral drugs.

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