

# Influenza Updates

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

Volume 2, Issue 1, February 2013

## News and Events

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### Happy New Year!

As this is our first newsletter for 2013 we would like to wish all contributing laboratories and departments that we work with the very best for the coming year. We thank you for sending us your influenza samples during 2012 and in previous years, and encourage you to continue sending samples in 2013.

This edition of Influenza Updates provides a review of virological surveillance conducted at the Centre during 2012. In total we received 4267 influenza samples from 33 laboratories in 13 countries. Of viruses collected during 2012 and with type/subtype determined at the Centre to date, the majority (62%) were confirmed to be A(H3N2), followed by a significant portion of Type B influenza viruses (30%). The majority of A(H3N2) viruses were found to be antigenically and genetically similar to A/Victoria/361/2011, the recommended strain for both the 2012-2013 Northern Hemisphere and 2013 Southern Hemisphere vaccines. The high prevalence of circulating A(H3N2) viruses is also reflected in the current northern hemisphere season to date, particularly in North America.

During 2012 we were also visited by scientists and collaborators from several different countries for both research and training purposes. We enjoy meeting and working with our colleagues from the influenza surveillance and research community, and our relationships are strengthened through these opportunities for knowledge transfer and exchanging perspectives between our laboratories.

2013 is shaping up to be another busy year, with several visitors and training activities already confirmed. We look forward to meeting you if the opportunity arises and providing whatever assistance we can to support your influenza surveillance and research activities.

### Shipping samples

If possible, please send us your viruses on a regular basis soon after collection throughout the year, rather than storing them for several months before shipping. We understand that this may result in some extra effort to prepare regular shipments. However, samples are most informative and useful to our understanding of currently circulating viruses when they have been collected recently.

We prefer to receive viral isolates whenever possible but also accept original clinical specimens. If you have any questions about shipping samples please contact us at [whoflu@influenzacentre.org](mailto:whoflu@influenzacentre.org).

### Call for influenza samples

The WHO Consultation on the Composition of Influenza Vaccines for the Northern Hemisphere 2013-2014 will be held in Geneva on 18-21 February.

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 recommendations if they can be analysed before the Consultation.

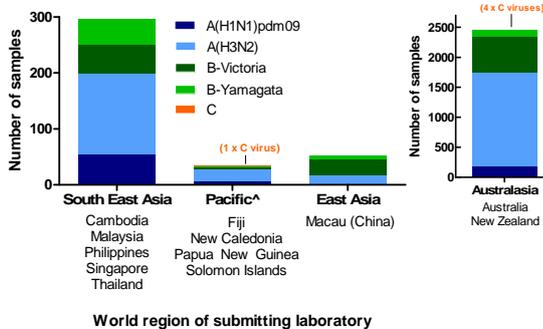


# The Year in Review: Virus activity 1 Jan—31 Dec 2012

The data below shows results for viruses collected between 1 January and 31 December 2012 that have been analysed at the Centre as of 4 February, 2013.

## Virus types/subtypes<sup>†</sup>

The type and subtype/lineage of 2840 viruses have been determined. The majority of viruses were A(H3N2) [1760 viruses].

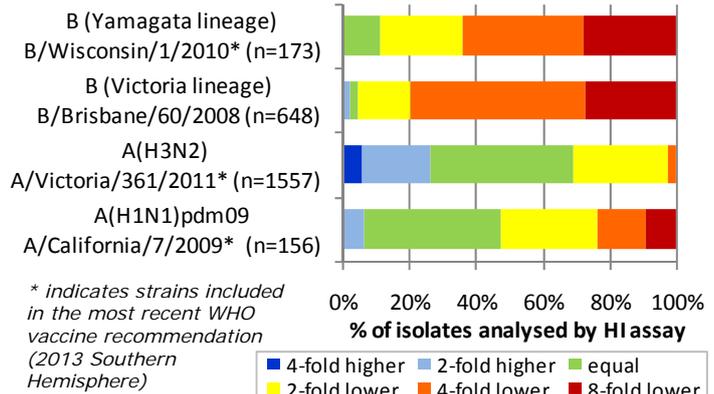


<sup>^</sup> The Pacific region comprises countries in Polynesia, Melanesia and Micronesia.

<sup>†</sup> Subtypes and lineages are based on analysis of the HA and in some cases confirmed by genetic analysis of NA.

## Antigenic analysis

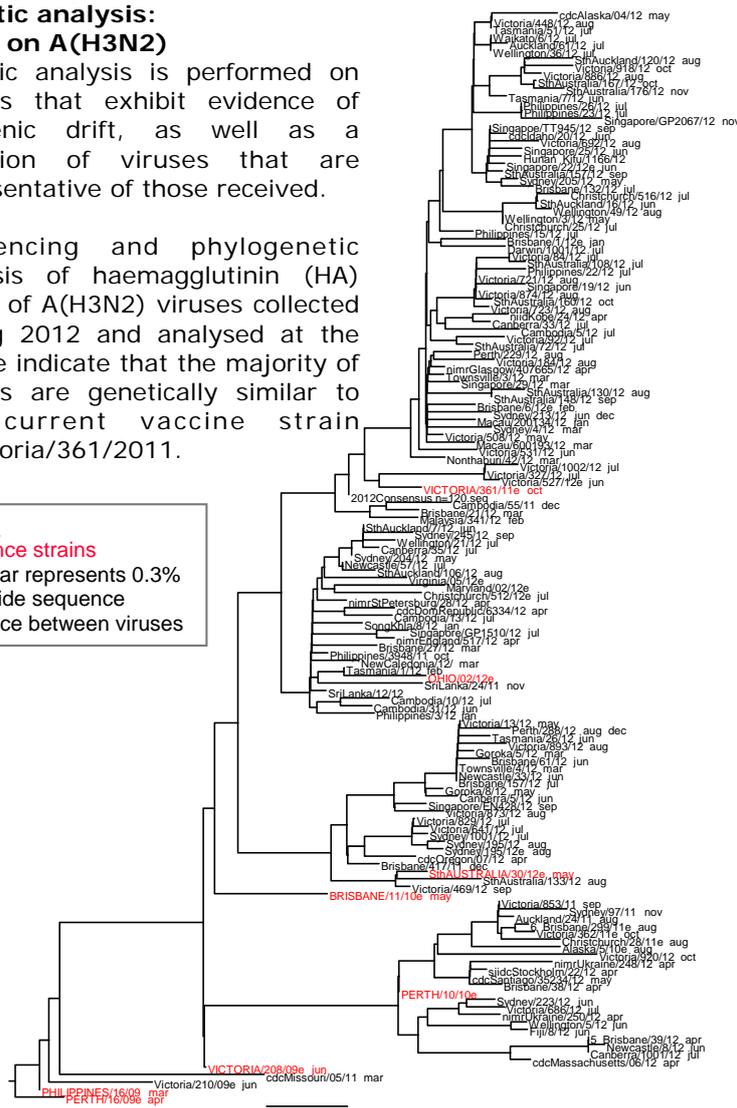
Haemagglutination inhibition (HI) assays indicate that most isolates are antigenically similar to current vaccine strains, with a minority of low reactors (8-fold lower HI titres compared to reference strains). Detection of low reactors with specific antisera may be due to several different factors,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



## Genetic analysis: focus on A(H3N2)

Genetic analysis is performed on viruses that exhibit evidence of antigenic drift, as well as a selection of viruses that are representative of those received.

Sequencing and phylogenetic analysis of haemagglutinin (HA) genes of A(H3N2) viruses collected during 2012 and analysed at the Centre indicate that the majority of viruses are genetically similar to the current vaccine strain A/Victoria/361/2011.



**Legend**  
 Reference strains  
 Scale bar represents 0.3% nucleotide sequence difference between viruses

## 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 2567 viruses tested, three A(H1N1)pdm09 viruses - two from Perth and one from Singapore - had highly reduced sensitivity to oseltamivir. All three viruses were 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).

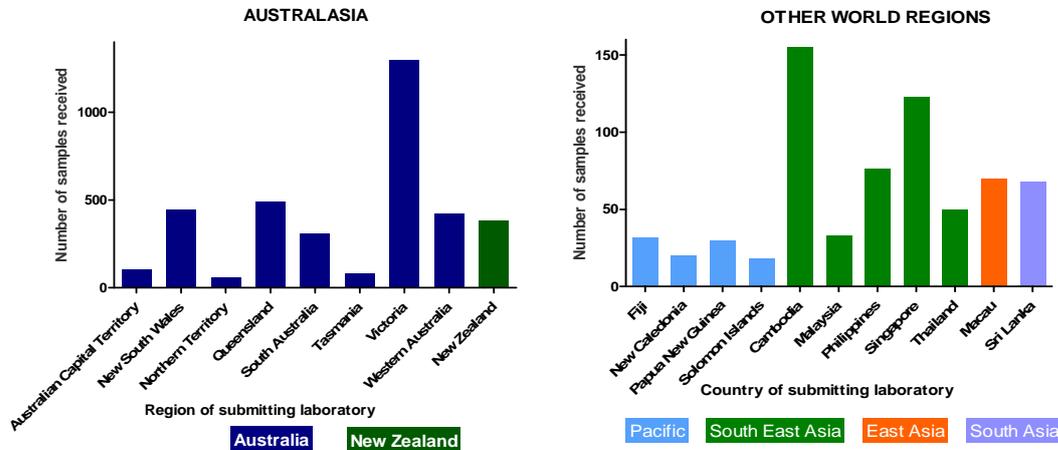
Viruses tested for resistance to		
Type/subtype	No. sensitive viruses	No. resistant viruses
A(H1N1)pdm09	166	3 (1.8%)
A(H3N2)	1571	0
B	830	0



## The Year in Review: Centre activity 2012

During 2012 the Centre received 4267 influenza samples from 33 laboratories in 13 countries. Overall a total of 4070 samples were analysed by RT-PCR assay and/or cultured and analysed by HI assay.

### Influenza samples received at the Centre 1 January—31 December 2012



#### Antigenic analysis

A total of 2824 influenza isolates submitted from contributing laboratories were analysed by HI assay (Table 1).

#### Genetic analysis

Sequencing was performed on 443 HA, 449 NA, 264 MP and 215 NS genes. A total of 783 gene sequences from 408 human viruses were deposited with the GISAID EpiFlu™ database (<http://www.gisaid.org>) by the Centre (Table 2).

#### Neuraminidase inhibitor resistance

A total of 2772 influenza isolates were tested by neuraminidase inhibition (NAI) assay for susceptibility to the antiviral drugs oseltamivir and zanamivir (Table 3).

Country of submitting laboratories	Table 1: Number of viruses analysed by HI assay*				Table 2: Number of viruses with gene sequences deposited with GISAID				Table 3: Number of viruses tested by NAI assay		
	A(H1N1) pdm09	A(H3N2)	B Victoria	B Yamagata	A(H1N1) pdm09	A(H3N2)	B	C	A(H1N1) pdm09	A(H3N2)	B
Australia	94	1215	573	63	76	97	80	1	81	1208	601
Cambodia	26	44	57	-	7	7	7	-	26	44	57
Fiji	4	5	8	1	5	1	2	-	4	5	9
Macau SAR	-	27	31	12	-	2	7	-	-	27	43
Malaysia	1	1	11	2	3	1	8	-	1	1	13
New Caledonia	-	6	2	1	1	1	-	-	-	1	1
New Zealand	69	222	27	52	10	16	10	-	72	225	81
Papua New Guinea	5	3	-	1	3	2	1	-	6	3	1
Philippines	4	41	5	23	4	4	8	-	4	41	29
Singapore	30	43	27	16	6	4	12	-	29	43	43
Soloman Islands	-	-	-	-	-	-	1	-	-	-	1
Sri Lanka	3	17	10	1	3	2	5	-	3	17	11
Thailand	5	9	17	10	1	2	8	-	5	9	27
<b>Total</b>	<b>241</b>	<b>1633</b>	<b>768</b>	<b>182</b>	<b>119</b>	<b>139</b>	<b>149</b>	<b>1</b>	<b>231</b>	<b>1624</b>	<b>917</b>

\* 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 into eggs to obtain potential vaccine strains. During 2012, 3 A(H1N1)pdm09, 11 A(H3N2) viruses and 9 B viruses were successfully isolated in eggs at the Centre.



## The Year in Review: Visitors to the Centre 2012

We were pleased to receive and host several visitors at the Centre during 2012. Please contact us if you would like to visit us or undertake training in laboratory-based influenza surveillance techniques at the Centre.

### Visitors

Dr Fahimeh Rahnama; Auckland District Health Board, Auckland, New Zealand.

Dr Geethani Wickramasinghe; Former Director NIC, Medical Research Institute, Colombo, Sri Lanka (*pictured at right, centre, with Aeron Hurt and Anne Kelso*).

Ms Jacqui Ralston; Institute of Environmental Science and Research (ESR), Wellington, New Zealand.

Dr Ip Peng Kei; Public Health Laboratory, Health Bureau, Macau SAR, China (*pictured lower right*).

Dr William Lau, A/Prof Eric Yap, A/Prof Tan Boon Huan and Ms Shirley Seah; Defence Medical and Environmental Research Institute (DMERI), Singapore.

Dr Janice Lo; Director NIC, Centre for Health Protection, Hong Kong SAR, China.

Dr Nadine Holmes; Sydney Emerging Infectious Diseases and Biosecurity Institute (SEIB), Sydney, Australia.

Dr Philippe Buchy; Director NIC, Institut Pasteur du Cambodge, Phnom Penh, Cambodia.

Dr Danuta Skowronski; British Columbia Centre for Disease Control, Vancouver, Canada.

Dr Gary Yuk Fai Lau, Ms Lynn Lay Hoon Tang and Ms Li Fang Kuah; DSO National Laboratories, Singapore.



### Research and Training

Dr Vijay Dhanasekaran; Program of Emerging Infectious Diseases, Duke-NUS Graduate Medical School in Singapore, Singapore. *Research collaboration*

A/Prof Jamal I-Ching Sam; Associate Professor, Director NIC, Tropical Infectious Diseases Research and Education Centre at the University of Malaya, Kuala Lumpur, Malaysia. *Learned serological and NAI assays and conducted analysis of research samples using these techniques.*

Ms Shirley Gek Kheng Seah; Defence Medical and Environmental Research Institute (DMERI), DSO National Laboratories, Singapore. *Trained in amniotic inoculations and harvesting of embryonated hens eggs.*

Ms Vina Arguelles and Ms Herma Base; Research Institute for Tropical Medicine, Philippines. *Trained in virus isolation, serology/HI assays, PCR-ID, sequencing and phylogenetic analysis and NAI assays.*

Ms Le Thi Thanh; Virology Department, National Institute of Hygiene and Epidemiology (NIHE), Vietnam (*pictured upper right*). *Trained in high-throughput serology techniques.*



(*Pictured at right, from left to right*)

Ms Kiti Rehier (Majuro Hospital Laboratory, Majuro, Marshall Islands), Mr Alan Mallari (Guam Public Health Laboratory, Guam), Ms Shalini Pravin (Center for Communicable Disease Control, Suva, Fiji). *Trained in real-time PCR, immunofluorescence for detection of influenza virus, cell culture and serology techniques relevant to influenza virus characterisation. They were accompanied by Ms Sala Elbourne (far right) from the Secretariat of the Pacific Community.*

