Influenza Updates

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

@WHOCCFluMelb

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Preparation for the upcoming influenza season

Winter and the influenza season is fast approaching over the next few months across many Southern Hemisphere countries. This means that any sample you are able to send to us will be vital in our continued surveillance efforts.

With this in mind, please note the following points:

- Please send us your samples (ideally March 2024 onwards) 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 respiratory specimens
- We need to receive samples by the end of August at the very latest (and preferably earlier) in order to process them in time for the Influenza Vaccine Consultation.
- The WHO Shipping Fund Project (SFP) is available to assist National Influenza Centres in covering the cost of shipping samples to WHO Collaborating Centres up to four times per year. It is recommended that one of the shipments be in July to mid-August. If you have any questions about shipping samples or would like information about accessing the WHO Shipping Fund, please contact us at Enquiries@influenzacentre.org.

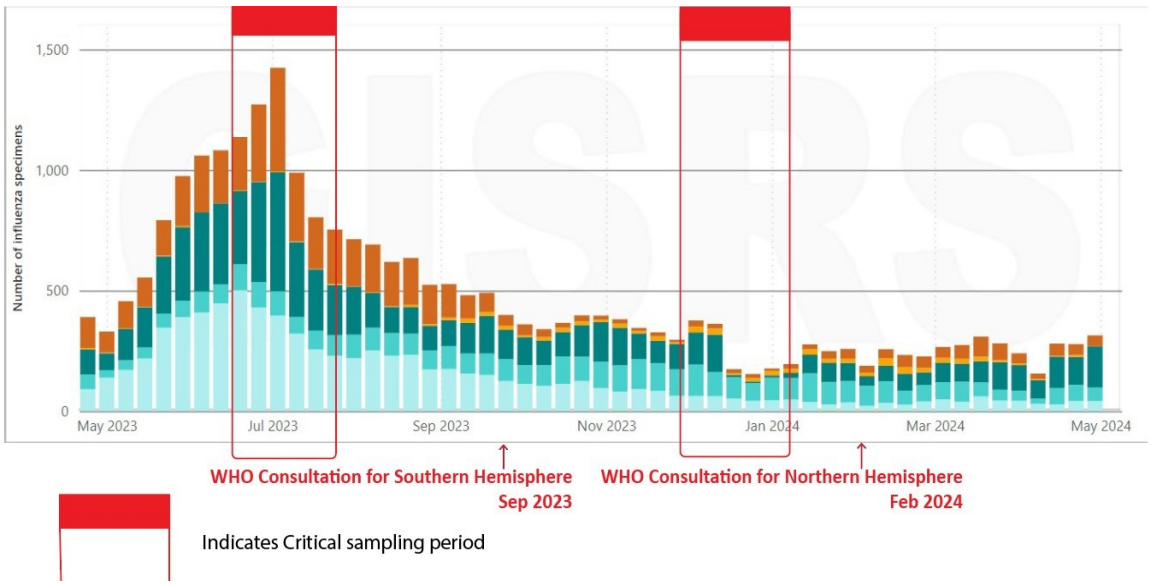


Figure adapted from FluNet

WHO Collaborating Centre for Reference and Research on Influenza
VIDRL

Doherty Institute

The University of Melbourne

The Royal Melbourne Hospital

A joint venture between The University of Melbourne and The Royal Melbourne Hospital

Recommendations for Northern Hemisphere 2024-2025 vaccine announced

The WHO Consultation on the Composition of Influenza Vaccines for the Northern Hemisphere 2024-2025 was announced in Montreux, Switzerland on 23 February 2024. The WHO made the following recommendation:

It is recommended that **trivalent** vaccines for use in the 2024-2025 influenza season (Northern Hemisphere winter) contain the following:

Egg-based vaccines

- an A/Victoria/4897/2022 (H1N1)pdm09-like virus;
- an A/Thailand/8/2022 (H3N2)-like virus; and
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus

Cell– or recombinant-based vaccines

- an A/Wisconsin/67/2022 (H1N1)pdm09-like virus;
- an A/Massachusetts/18/2022 (H3N2)-like virus; and
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus.

For quadrivalent egg- or cell culture-based or recombinant vaccines for use in the 2024-2025 northern hemisphere influenza season:

Egg-, cell- or recombinant-based Vaccines

- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

Contribution of National Influenza Centres to the vaccine recommendations

We thank everyone who has sent us influenza samples prior to the February 2024 influenza vaccine Consultation. Your viruses provided essential data on recently circulating strains and helped to inform the choice of recommended vaccine strains.

In this context, we would like to acknowledge the contribution and critical role played by WHO National Influenza Centres and other submitting laboratories in providing influenza samples to WHO Collaborating Centres, not only for the purposes of analysis and surveillance, but also for the provision of potential vaccine candidates. Please continue to send us your samples. The need for constant surveillance remains as the influenza virus continues to circulate and evolve.

Training at the Centre and visits to regional laboratories

Clyde Dapat, together with Ammar Aziz of Translational Diagnostics Laboratory and Wytamma Wirth of Microbiological Diagnostic Unit Public Health Laboratory were engaged by the WHO Country Office in the Philippines for a training course in bioinformatics analysis of SARS-CoV-2 and influenza in Manila between 14-19 April 2024. There were 18 participants coming from national and regional public health laboratories in the country. Participants received lectures and performed hands-on exercises on quality assessment of NGS data, genome assembly, annotation, phylogenetics, and submission of sequence data to genetic databases.

Brisbane Convention and Exhibition Centre 29 September - 2 October 2024

Conference link below:

Programme | OPTIONS XII 2024 | OPTIONS XII Event | OPTIONS 2024 Brisbane | Influenza Congress

Directors Departure

It is with great sadness that The Centre announces the departure of our esteemed Director, Professor Kanta Subbarao. Kanta will be leaving The Centre in May 2024. She has been a source of inspiration and leadership for all of us, and her departure will leave a significant void within our organization. We wish Kanta all the best as she takes up a new role at Laval University in Quebec.

During her tenure, Kanta has made remarkable contributions to the field of virology and infectious diseases. Recognized globally for her expertise in pathogenesis and vaccine development for respiratory viruses such as influenza, SARS, MERS, and COVID-19, Kanta has been instrumental in advancing research at the Royal Melbourne Hospital and Doherty Institute.

Under her leadership, the WHO Collaborating Centre for Reference and Research on Influenza has maintained its excellence in public health and research, playing a crucial role in the Global Influenza Surveillance and Response System. Professor Kanta's pioneering work during the pandemic, including the development of a widely used neutralizing antibody assay for SARS-CoV-2 and establishment of critical research infrastructure, has been invaluable.

Her dedication, expertise, and unwavering commitment, particularly during the pandemic, have left an indelible mark on our organization and the global health community. We extend our heartfelt gratitude for her exceptional contributions and wish her continued success in her future endeavors.

Thank you, Kanta, for your tireless efforts and leadership. You will be deeply missed.

Recent activities at the Centre (1 January — 30 April 2024)

Below is a summary of surveillance activities at the Centre during this current reporting period. 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 2629 influenza samples from the laboratories and institutions listed below during the period 1 January—30 April 2024.

AUSTRALIA: Canberra Hospital, Westmead Hospital, The Children's Hospital at Westmead , John Hunter, Royal Darwin Hospital, Pathology Queensland , Queensland Health Forensic and Scientific Services, SA Pathology, Royal Hobart Hospital, Australian Clinical Labs, Austin Pathology, Monash Medical centre, Alfred Hospital, Royal Children's Hospital, Royal Melbourne Hospital, VIDRL, Pathwest QEII Medical Centre

BRUNEI: Ripas Hospital

CAMBODIA: Institut Pasteur du Cambodge

INDIA: National Institute of Virology

MALAYSIA: Institute for Medical Research

MALAYSIA: University of Malaya

PAPUA NEW GUINEA: Institute of Medical Research

PHILIPPINES: Research Institute for Tropical Medicine

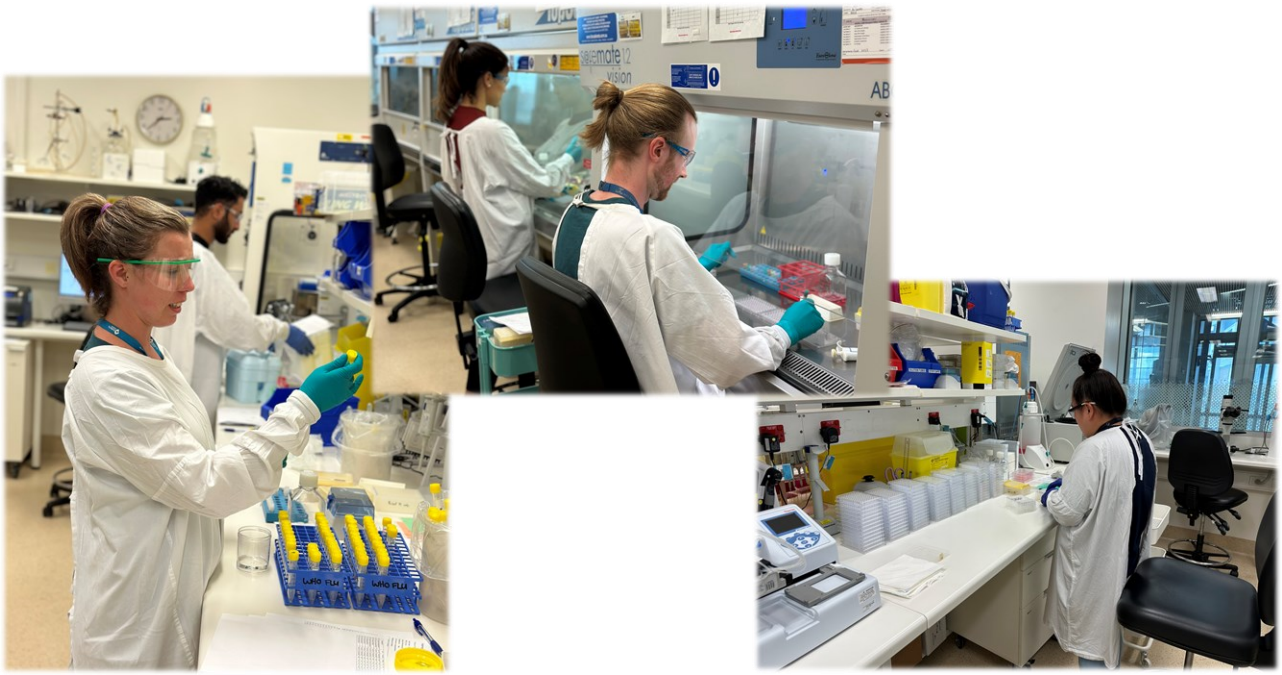
SINGAPORE: National Public Health Laboratory

SOLOMON ISLANDS: National Referral Hospital

SRI LANKA: Medical Research Institute

TIMOR-LESTE: Laboratorio Nacional Da Saude

Isolation of viruses in eggs:
The Centre undertakes primary isolation of selected viruses in eggs to obtain potential vaccine strains. From 1 January to 30 April 2024, 10 A(H3N2) and 8 viruses A(H1N1) were successfully isolated in eggs at the Centre.



Antigenic analysis
1052 viruses analysed by haemagglutination inhibition (HI) assay

Antiviral drug susceptibility
578 viruses analysed by neuraminidase inhibition (NAI) assay

Sequencing
493 viruses analysed
493 HA genes
493 NA genes
422 MP genes
81 NS genes

Country of submitting laboratory	No. of viruses analysed by HI assay*			No. of viruses tested by NAI assay*			No. of viruses sequenced by NGS, ONT or Sanger sequencing			
	A(H1N1)pdm09	A(H3N2)	B/Victoria	A(H1N1)pdm09	A(H3N2)	B/Victoria	A(H1N1)pdm09	A(H3N2)	B/Victoria	B lineage undetermined
Australia	324	368	31	151	182	13	117	187	20	15
Cambodia	30	13	8	29	13	7	28	13	8	0
India	11	10	4	10	10	2	0	1	0	0
Malaysia	41	68	0	7	12	0	9	7	0	3
Papua New Guinea				0	0	4	0	0	4	0
Philippines	5	35	26	5	35	21	4	22	13	0
Singapore	30	31	17	30	31	16	1	0	0	0
Sri Lanka							8	26	7	0
Total	441	525	86	232	283	63	167	256	52	18

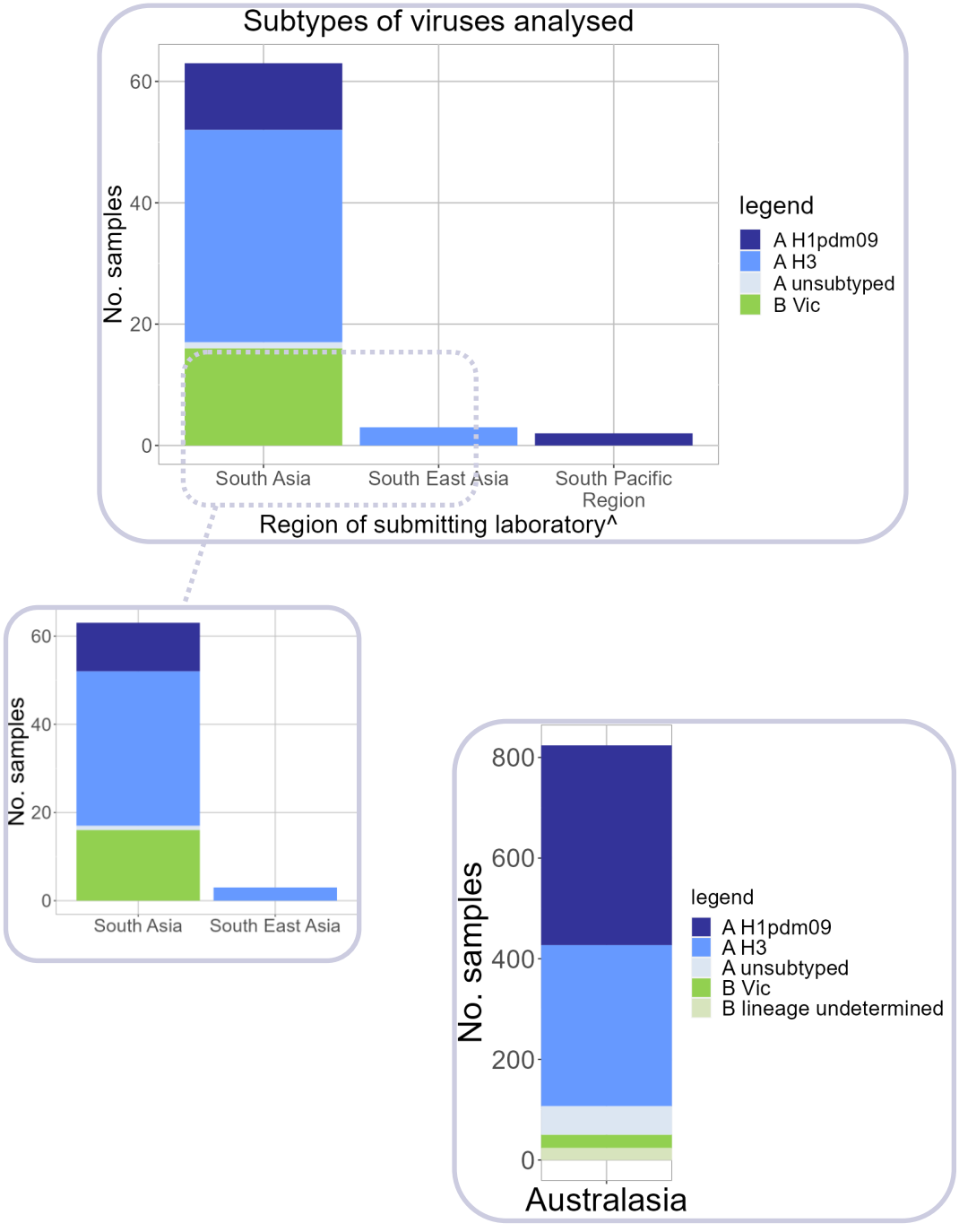
**Subtypes and lineages are based on analysis of HA and in some cases confirmed by genetic analysis of NA.*

Surveillance update: Virus activity 1 January—30 April 2024

The data below are results for viruses collected or sampled between 1 January and 30 April 2024 that have been analysed at the Centre as of 7 May 2024.

Virus types/subtypes[†]
The type and subtype/lineage of 2091 viruses have been determined.

38.7% A(H1N1)pdm09
53.4% A(H3N2)
7.1% B/Victoria



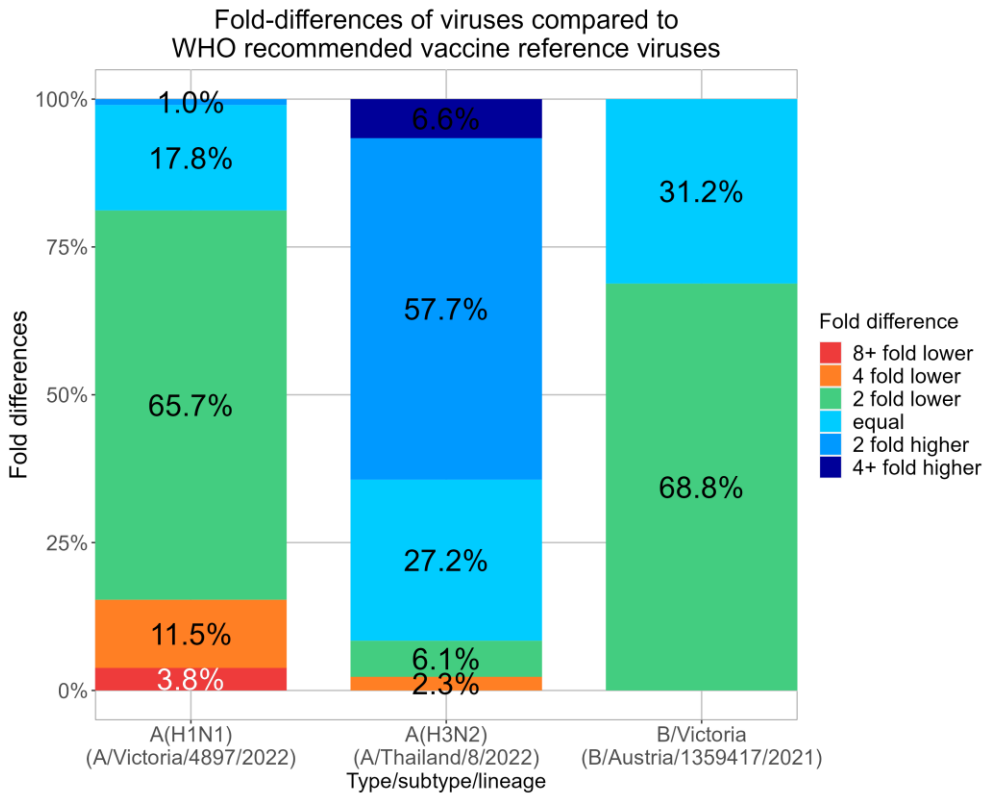
[†] *Subtypes and lineages are based on analysis of the HA and in some cases confirmed by genetic analysis of NA.*

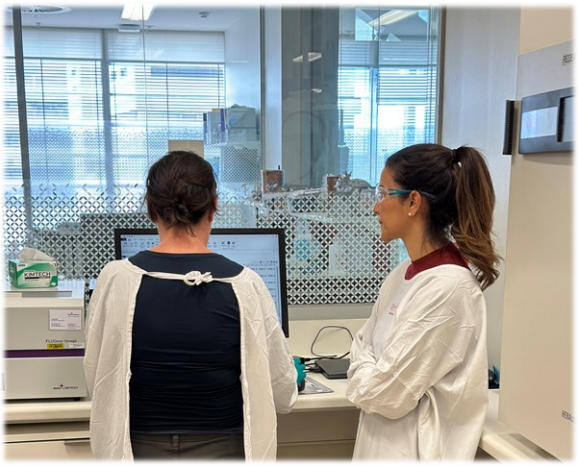
^The Pacific region comprises countries in Polynesia, Melanesia, and Micronesia.

Antigenic analysis*

A total of 1052 viruses were tested using the haemagglutination inhibition (HI) assay.

Viruses were identified as low-reactors if their titre against reference antiserum was at least 8-fold lower than the titre of the reference virus. All A(H3N2) and B/Victoria viruses were antigenically similar to their respective reference strains. A small proportion (3.8%) of A(H1N1) viruses were low reactors to the reference strain A/Victoria/4897/2022.

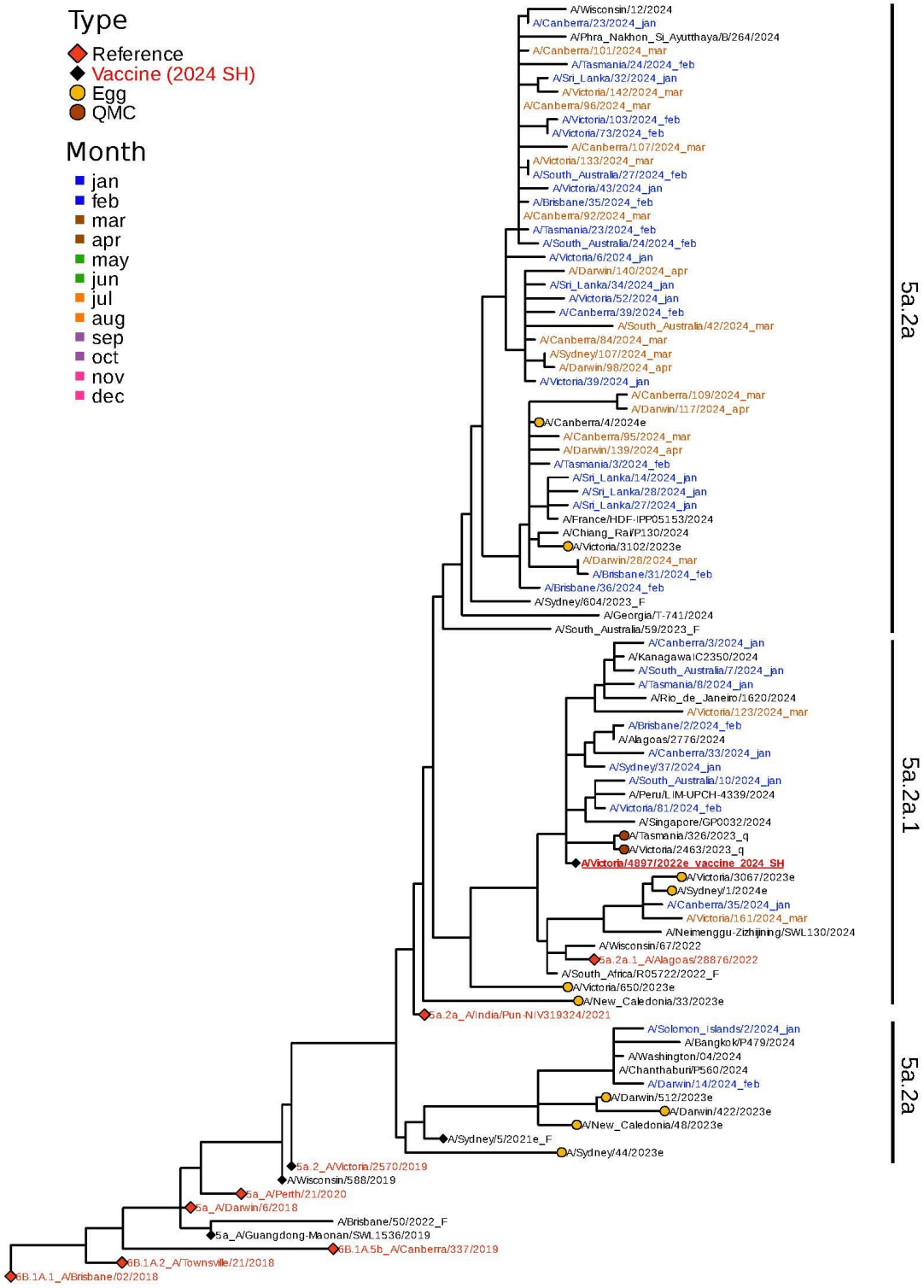




† *Subtypes and lineages are based on analysis of the HA and in some cases confirmed by genetic analysis of NA.*

Genetic analysis:
Focus on A(H1N1)pdm09
Sequencing of the haemagglutinin (HA) gene

Phylogenetic analysis shows the majority of A(H1N1) pdm09 viruses belong to the 5a.2a clade.



Antiviral drug susceptibility testing:

301 viruses tested by neuraminidase inhibition (NAI) assay

Testing for susceptibility to the antiviral drugs oseltamivir (Tamiflu), zanamivir (Relenza), peramivir, and laninamivir showed that no viruses had highly reduced inhibition by one or more of these neuraminidase inhibitors (NAI).

Type/subtype/ lineage	Oseltamivir			Peramivir			Laninamivir			Zanamivir		
	Normal inhibition	Reduced inhibition	Highly reduced Inhibition	Normal inhibition	Reduced inhibition	Highly reduced Inhibition	Normal inhibition	Reduced inhibition	Highly reduced Inhibition	Normal inhibition	Reduced inhibition	Highly reduced Inhibition
A(H1N1)pdm09	144	1	0	145	0	0	145	0	0	145	0	0
A(H3N2)	145	0	4	149	0	0	149	0	0	145	4	0
B/Victoria	7	0	0	7	0	0	7	0	0	7	0	0
Total	**296**	**1**	**4**	**301**	**0**	**0**	**301**	**0**	**0**	**297**	**4**	**0**

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.

Viruses with highly reduced inhibition to one or more NAI

Type/subtype/lineage		Country of submitting laboratory	NAI(s) with highly reduced inhibition (marked with *)			
			Oseltamivir	Peramivir	Laninamivir	Zanamivir
A(H3N2)	A/VICTORIA/38E/2024	Australia	*	Normal	Normal	*
	A/VICTORIA/38F/2024	Australia	*	Normal	Normal	*
	A/VICTORIA/38H/2024	Australia	*	Normal	Normal	*
	A/VICTORIA/38J/2024	Australia	*	Normal	Normal	*

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