Influenza Updates

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

@WHOCCFluMelb

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WHO Recommendations for the Southern Hemisphere 2022 Influenza Vaccines

The WHO Consultation on the Composition of Influenza Vaccines for the Southern Hemisphere 2022 was held as an online event between 13-30 September 2021, with discussions covering seasonal influenza occurring between 13-23 September, and zoonotic influenza viruses with pandemic potential between 28-30 September.

Following the Consultation, the WHO made the following recommendations:

It is recommended that ***quadrivalent*** vaccines for use in the 2022 southern hemisphere influenza season contain the following:

Egg-based Vaccines

- an A/Victoria/2570/2019 (H1N1)pdm09 -like virus;
- an A/Darwin/9/2021 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus; and
- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

Cell- or recombinant-based Vaccines

- an A/Wisconsin/588/2019 (H1N1) pdm09-like virus;
- an A/Darwin/6/2021 (H3N2)-like virus;
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This year there has been a continued reduction in influenza activity due to travel restrictions and other strategies to counteract the spread of the SARS-CoV-2 virus. This has meant that there were fewer viruses available for characterisation during the April to August time period compared to pre-COVID years.

More details about the recommendations can be found here.

AIVC recommendation for the composition of influenza vaccine for Australia in 2022

The Australian Influenza Vaccine Committee (AIVC) met on 6 October 2021 to recommend the composition of the influenza virus vaccines for 2022.

The full statement can be accessed here.

Contribution of National Influenza Centres to the vaccine recommendations

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

We are especially pleased that the most recently added A(H3N2) viruses in the vaccine recommendation, A/Darwin/9/2021 (egg) and A/Darwin/6/2021 (cell or recombinant), were originally submitted to our Centre by **The Royal Darwin Hospital**. We would also like to thank the **National Public Health Laboratory, Singapore** for a clinical sample of the B/Victoria/2/87-lineage virus (B/Singapore/WUH4618/2021), which was isolated in qualified cells at the Centre and selected as a suitable cell or recombinant candidate vaccine strain for the B/Austria/1359417/2021-like virus.

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.

Victorian collaboration boosts coronavirus research

Centre Director Kanta Subbarao and Senior Research Scientist Dr Mariana Baz were featured in an article announcing a collaboration between Agriculture Victoria and the Peter Doherty Institute for Infection and Immunity.

This collaboration will involve undertaking work on developing coronavirus treatments and vaccines at the AgriBio facility in Bundoora (Melbourne) over the next two years.

More information on the project can be found here.

14th Australian Influenza Symposium 2021

Places are filling fast for the 14th Australian Influenza Symposium, to be held **11-12 November 2021** at **The Peter Doherty Institute for Infection and Immunity**.

It is likely that the symposium will either be a hybrid or fully virtual event, depending on COVID-19 restrictions in place in Melbourne. We will follow up with more details in mid to late October as to whether a registrant will be an on-site or virtual attendee. Please note, should the symposium become fully virtual, the session times will change to reflect this.

For registration and program details, please check our Events page.

ABSTRACT SUBMISSION CLOSING DATE - 18 October 2021

There are two sessions in the program for short presentations (15 minutes including questions). Speakers will be chosen from submitted abstracts, which should relate to work in the fields of COVID-19, influenza, or RSV. The sessions will broadly cover epidemiology and research areas, one on each day of the symposium.

Further details on abstract submission are available on our Events page (link above). Unfortunately there will be no poster sessions, and only a limited number of abstracts can be accepted.

Notable upcoming conferences

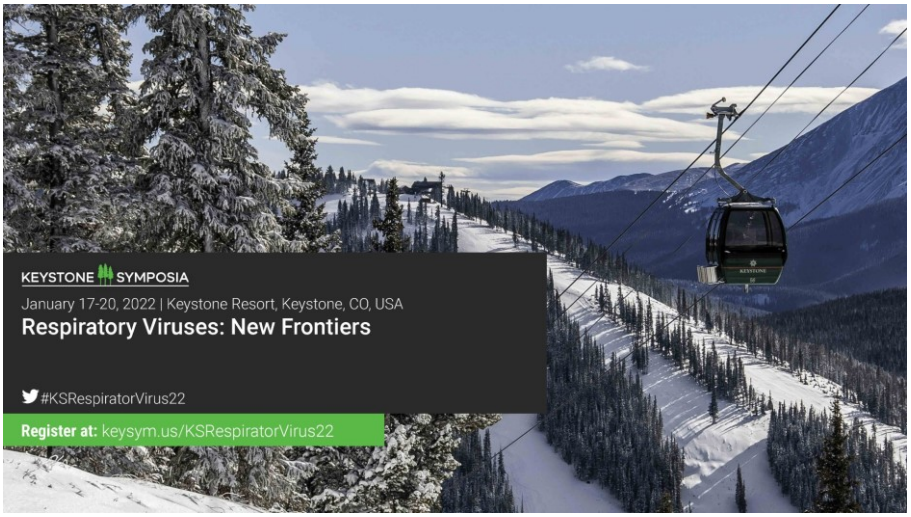
ISIRV-WHO Virtual Conference - COVID-19, Influenza and RSV: Surveillance-informed prevention and treatment

19-21 October 2021

The conference will review current information on the evolution, epidemiology and impact of SARS-CoV-2, influenza, RSV, and other respiratory viruses. In addition, implications for surveillance strategies and progress on vaccines, antivirals, immunomodulators and other countermeasures will also be discussed.

Please use this link to register and view the program.

Keystone Symposia - Respiratory Viruses: New Frontiers



17-20 January 2022

Registration is currently open for the Respiratory Viruses: New Frontiers Keystone Symposia, co-organised by Centre Director Kanta Subbarao.

This symposia is a joint event alongside the Viral Immunity: Basic Mechanisms and Therapeutic Applications symposia.

Both events will be a hybrid meeting, with online access also available.

Featured Research Article

'A second external quality assessment of isolation and identification of influenza viruses in cell culture in the Asia Pacific region highlights improved performance by participating laboratories'

Featuring Vivian Leung and many others from the Centre

Published in the *Journal of Clinical Virology* this September, the article describes the results of assessing influenza isolation and identification techniques by NICs in the Asia-Pacific region.

Techniques assessed included haemagglutination assays and real time RT-PCR in addition to haemagglutination inhibition and/or immunofluorescence assays.

Compared to the results of assessments performed in 2016, 2019 saw significant improvement across laboratories for all techniques.

Leung VKY, Deng YM, Todd A, Peck H, Buettner I, Zakis T, Subbarao K, Barr IG, Nahapetyan K, Inbanathan FY, Samaan M, Reading PC. A second external quality assessment of isolation and identification of influenza viruses in cell culture in the Asia Pacific region highlights improved performance by participating laboratories. J Clin Virol. 2021 Sep;142:104907.
doi: 10.1016/j.jcv.2021.104907 PubMed link

Farewell and good luck

It is with sadness but good wishes that we announce the departure of Edin Mifsud and Shaeley Henderson. We thank Edin and Shaeley for their significant contributions to the Centre, and wish them all the very best their futures.

Dr Edin Mifsud had been a post-doctoral researcher with the Centre for the past four years. She has now taken on a position with Seqirus as a Medical Science Liaison.

Ms Shaeley Henderson had been an admin officer with the Centre for the past six months.

Recent activities at the Centre (1 January — 30 September 2021)

Below is a summary of surveillance activities at the Centre during this current reporting period. Centre activities have remained relatively quiet in 2021 due to decreased influenza cases resulting from social distancing and travel restriction measures implemented in response to COVID-19 across many countries. We anticipate that this decrease in the number of samples will continue while these measures are in place.

Samples received:

The Centre received 242 influenza samples from the laboratories and institutions listed below during the period 1 January — 30 September 2021.

AUSTRALIA: Westmead Hospital, The Children's Hospital at Westmead, Royal Darwin Hospital, Queensland Health Forensic and Scientific Services (QHFSS), SA Pathology, Alfred Hospital, Australian Clinical Labs, The Department of Health and Human Services, Monash Medical Centre, Northern Hospital, VIDRL

INDIA: National Institute of Virology

NEPAL: National Public Health Laboratory

NEW ZEALAND: Institute of Environmental Science and Research

PHILIPPINES: Research Institute for Tropical Medicine

SINGAPORE: National Public Health Laboratory

SOUTH AFRICA: National Institute for Communicable Diseases

THAILAND: Thai National Influenza Center

TIMOR-LESTE: Laboratório Nacional de Saúde

Isolation of viruses in eggs:

The Centre undertakes primary isolation of selected viruses in eggs to obtain potential vaccine strains. From 1 January — 30 September 2021, 11 A(H3N2) and 8 B/Victoria viruses were successfully isolated in eggs at the Centre.

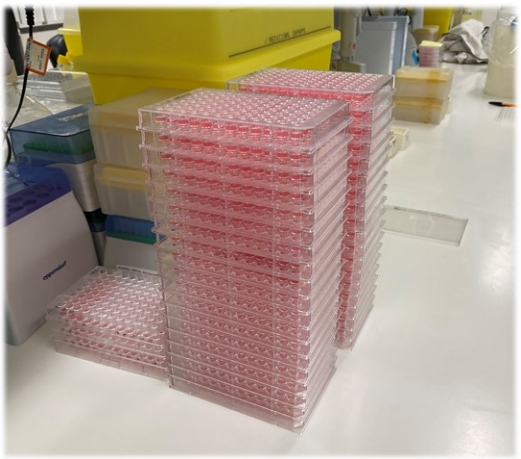
Recent activities at the Centre (1 January — 30 September 2021) continued

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

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

Sequencing
68 viruses analysed
65 HA genes
66 NA genes
59 MP genes
37 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 or Sanger sequencing			
	A(H1N1)pdm09	A(H3N2)	A(H3N2)v	B/Victoria	A(H1N1)pdm09	A(H3N2)	B/Victoria	A(H1N1)pdm09	A(H3N2)	A(H3N2)v	B/Victoria
Australia	1	18	1	1	1	21	1	1	20	2	2
India	6			1	6						
Nepal											1
New Zealand		2				2			3		1
Philippines		4		4		4	4		4		4
Singapore		3		17		3	17				
South Africa				12			12		1		12
Thailand									5		
Timor-Leste		8				8			12		
Total	**7**	**35**	**1**	**34**	**7**	**38**	**34**	**1**	**45**	**2**	**20**



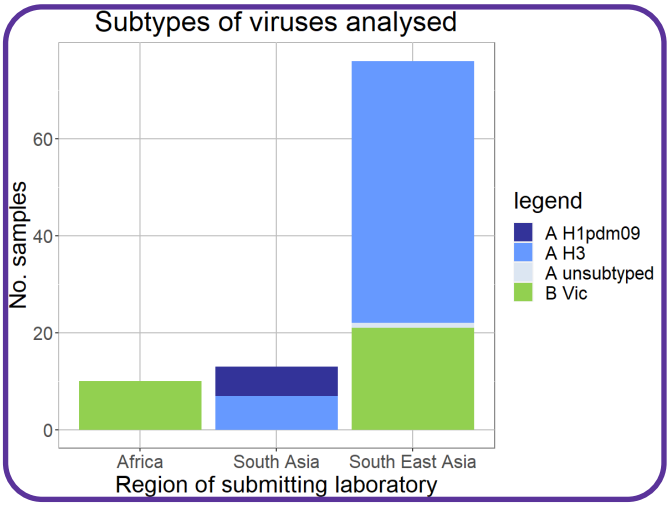
* *Subtypes and lineages are based on analysis of HA and in some cases confirmed by genetic analysis of NA.*

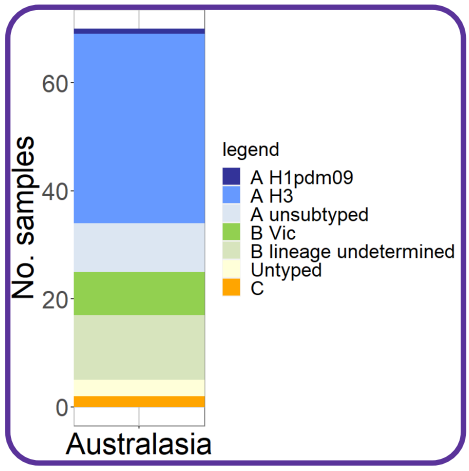
Surveillance update: Virus activity 1 January—30 September 2021

The data below are results for viruses collected between 1 January and 30 September 2021 that have been analysed at the Centre as of 6 October 2021.

Virus types/subtypes*
The type and subtype/lineage of 170 viruses have been determined.

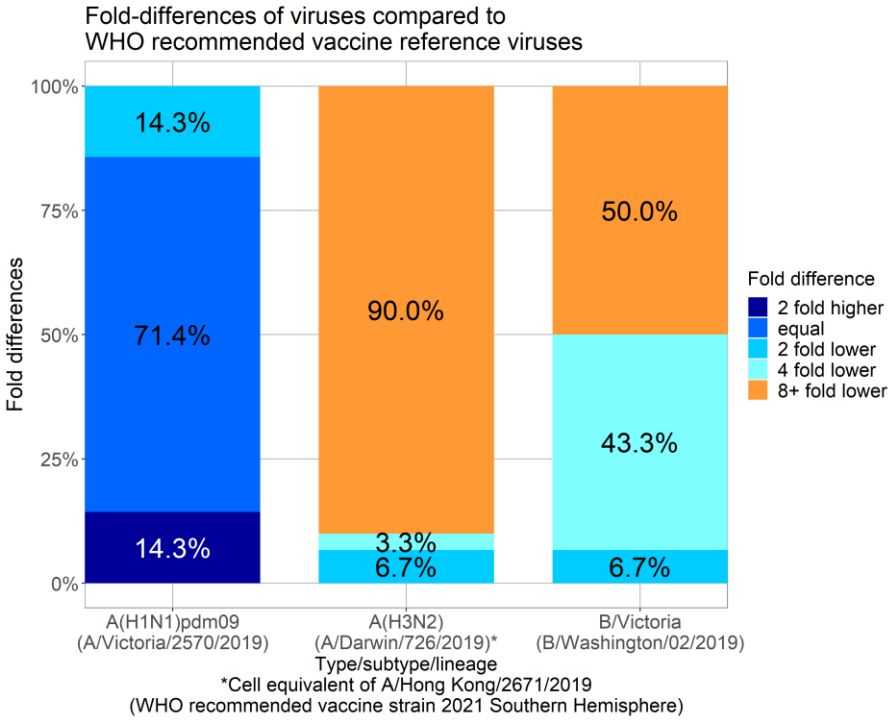
4.1% A(H1N1)pdm09
55.6% A(H3N2)
23.1% B/Victoria





Antigenic analysis*
A total of 1140 viruses were tested using the haemagglutination inhibition (HI) assay.

Viruses were identified as low-reactors if their titre with reference antiserum was at least 8-fold lower than the titre of the reference virus. Almost all A (H3N2) viruses, and half of the B/Victoria viruses were low reactors to their respective reference strains.



**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.

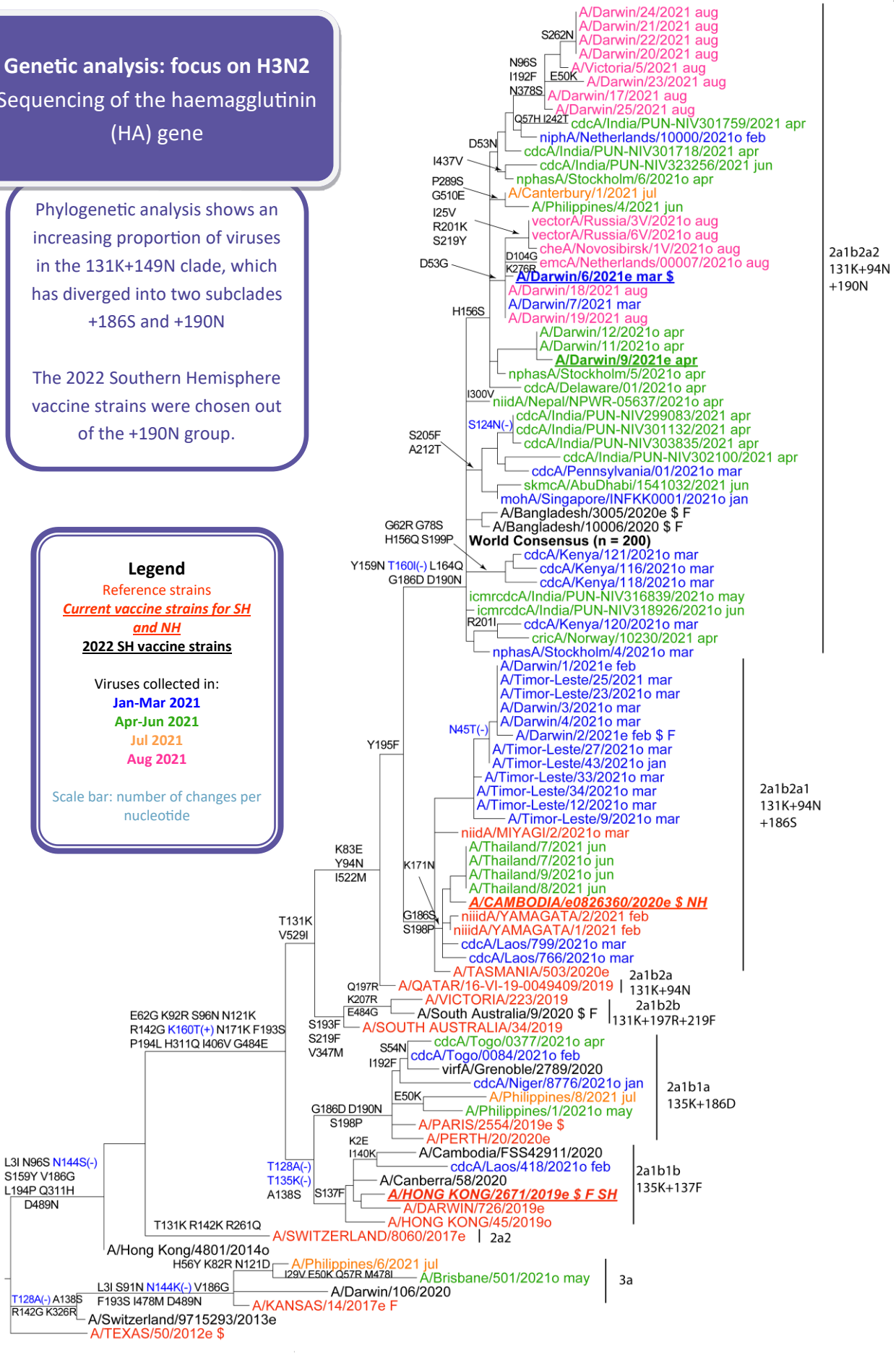
Surveillance update: Virus activity 1 January—30 September 2021 continued

Genetic analysis: focus on H3N2

Sequencing of the haemagglutinin (HA) gene

Phylogenetic analysis shows an increasing proportion of viruses in the 131K+149N clade, which has diverged into two subclades +186S and +190N

The 2022 Southern Hemisphere vaccine strains were chosen out of the +190N group.



Surveillance update: Virus activity 1 January—30 September 2021 continued

Antiviral drug susceptibility testing:
79 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 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	7			7			7			7		
A(H3N2)	36			36			36			36		
B/Victoria	32			32			32			32		
Total	**75**			**75**			**75**			**75**		

Normally, 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.

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