

Review of the 2019 influenza season in Australia and what to expect in 2020

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www.influenzacentre.org



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A reality check?

Get a grippe, America. The flu is a much bigger threat than coronavirus, for now.



By [Lenny Bernstein](#)

Feb. 2, 2020 at 12:00 a.m. GMT+11

The rapidly spreading virus has closed schools in Knoxville, Tenn., cut blood donations to dangerous levels in Cleveland and prompted limits on hospital visitors in Wilson, N.C. More ominously, it has [infected as many as 26 million people in the United States](#) in just four months, killing up to 25,000 so far.

In other words, a difficult but not extraordinary flu season in the United States, the kind most people shrug off each winter or handle with rest, fluids and pain relievers if they contract the illness.

But this year, a new coronavirus from China has focused attention on diseases that can sweep through an entire population, rattling the public despite the current magnitude of the threat. Clearly, the flu poses the bigger and more pressing peril; a handful of cases of the new respiratory illness have been reported in the United States, none of them fatal or apparently even life-threatening.

https://www.washingtonpost.com/health/time-for-a-reality-check-america-the-flu-is-a-much-bigger-threat-than-coronavirus-for-now/2020/01/31/46a15166-4444-11ea-b5fc-eefa848cde99_story.html

How was the 2019 SH influenza season for you?

- Normal season – nothing much different from any other
- Low season – similar to 2010, 2018
- Medium season – similar to 2011, 2013
- Big season – similar to 2012, 2014, 2015, 2016
- Massive season – Once in every decade or two
 - Pandemic of 2009
 - Flumageddon 2017
 - Flunami of



Summary of the 2019 Australian Influenza season

- A big “Influenza” season by most measures
 - NNDSS Lab confirmed influenza data
 - Highest “interseasonal” influenza activity (Jan-Mar) on record (again)
 - Highest **ever** number of lab confirmed cases recorded; (2019: 312,978, 2018: 58,736, 2017: 251,150)
 - High activity in Autumn-early winter (Apr-Jun) approx. x10 usual, Early Peak (Wk 27 w/b 1/7 norm mid Aug), very long season (30wk vs 12-16w avg.)
 - ASPREN-GP ILI data – Extended activity March-October, broad peak
 - Very high press coverage around extent and severity of season
 - Characteristics of season
 - Australia had mainly A(H3N2), followed by A(H1N1)pdm, some B’s
 - FluCan data
 - High number of hospital admissions 3915 (April 1-Oct 6) (725 2018, 3969 2017)
 - 6.3% admitted directly to ICU (8.1% 2018, 8.9% 2017; 7% 2015, 11% 2014)
 - Most hospitalizations due to A(H3N2), then B, small number of A(H1N1)pdm
- Influenza deaths (NNDSS); 902 deaths (2018 148) med. 86y (<1-106y)



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BREAKING NEWS A woman in her 20s has become the fourth case of novel coronavirus to be confirmed more...

10 April 2019

Australia on track for killer flu season as experts urge public to get vaccinated

By national medical reporter Sophie Scott
Posted 10 Apr 2019, 12:45pm

Health experts are warning Australia is on track for a killer flu season, with numbers showing three times as many people have been diagnosed with the virus so far this year, compared to the same period in previous years.

RELATED STORY: Flu surges early, prompting expedited launch of vaccine programs
RELATED STORY: Victorian child dies of flu during significant summer outbreak

In March, more than 10,000 people were diagnosed with the flu. In March 2018, that number was 3,173.

Chair of the Immunisation Coalition, Professor Robert Booy, said those affected were mainly in New South Wales, Victoria, Queensland and South Australia.

"The data I have received shows that we are seeing three times as many cases this year as last year," he said.

At the end of the first week in April, we were nearly halfway to our 2018 annual total.

Professor Booy said so far this year, nearly 27,000 people had been struck down by flu.

- New South Wales: 7,595 cases
- Queensland: 7,289 cases
- Victoria: 4,627 cases
- South Australia: 4,397 cases
- Western Australia: 1,498 cases
- Tasmania: 322 cases
- Northern Territory: 296 cases
- Australian Capital Territory: 203 cases

22 May 2019

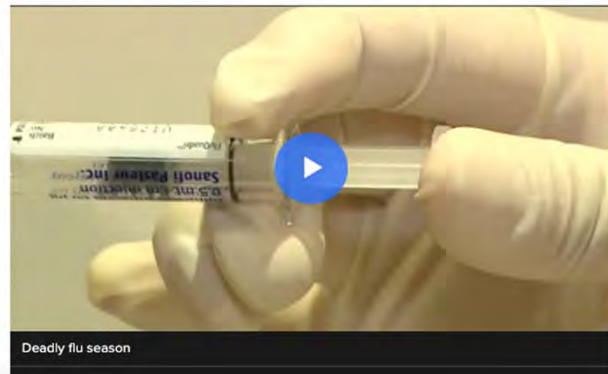
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Killer flu season sees record numbers of cases and deaths - and it's only just beginning

By Sarah Swain | 11:00am May 22, 2019



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BREAKING NEWS A woman in her 20s has become the fourth case of novel coronavirus to be confirmed more...

6 May 2019

Flu cases hit uncharted territory in NSW, but vaccines at the ready

By Nick Sas and Liv Gasben
Updated 6 May 2019, 3:09pm

Experts are baffled over an unprecedented start to the flu season, with more than 10,000 people diagnosed in NSW so far this year — almost three times more than the same period last year.

As NSW Health prepares for the impending peak flu season with 2.5 million vaccinations at the ready, the figures have left health authorities questioning how it will impact the state's health infrastructure.

The figures, revealed in the NSW communicable diseases report, show 10,121 recorded influenza cases to the end of April.

It is almost triple last year's influenza figures for the same period (3,803) and is also almost four times the number recorded in 2017 (2,884).

2017 was a record year for the virus, with 103,852 cases reported.

"We don't know what it means because this is a new phenomenon," NSW Health communicable

PHOTO: There has been an explosion of influenza cases in NSW. (ABC News: Kym Aglia)

RELATED STORY: Hospital runs out of flu vaccines as cases surge
RELATED STORY: A deadly flu season is approaching, so when should you get vaccinated?
RELATED STORY: Doctors expect the flu to kill at least 4,000 people this year. Here's what you need to know

Key points:

- At this time in 2018, 3,803 people had been

June 18 2019

news.com.au

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lifestyle > health > health problems

Flu season has turned deadly with sharp rise in national death toll

Health experts across the country are urging people to stay home if they are unwell, as the death toll from virus rises.

Rhian Deutrom @RH_Lani



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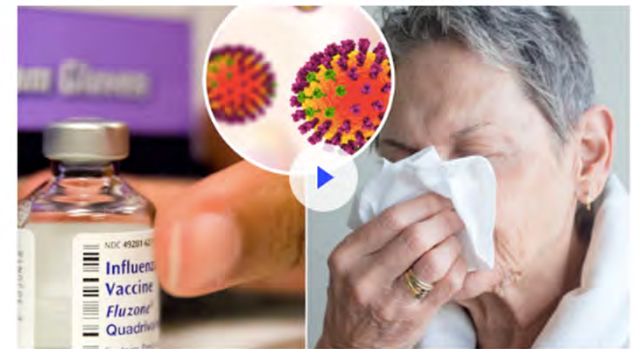
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20 May 2019

Flu deaths 2019 Australia: Three influenza strains causing deadly flu season

Sarah Wiedersehn • 7NEWS • Tuesday, 28 May 2019 1:42 pm



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Bushfire updates For the latest updates on bushfire warnings, visit ACT ESA or VicEmergency

Aug 8 2019

Flu strikes down more than 183,000 people this year, and it's not only the elderly who are being hit hard

7:30 By Michael Vincent
Updated 8 Aug 2019, 5:30pm



LIFE • WELLBEING •


12:02am, Sep 9, 2019 Updated: 8:23am, Sep 9


Flu season: 'Mutant crisis' created by media's drongo reading of numbers


9 September 2019



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 Given what's ahead, Scott Morrison must wonder why he ever wanted the top job

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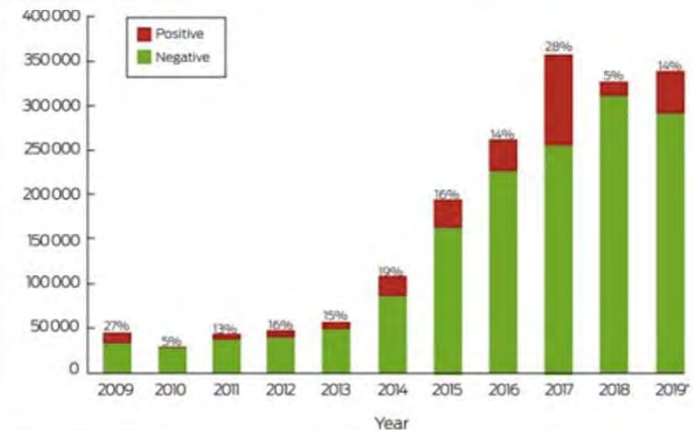


John Eider

Did the media beat up this year's flu season and turn it into the Black Death?

Just about, according to a letter published online in the *Medical Journal of*

Number of influenza tests and positivity (%), New South Wales sentinel laboratories, 2009 to 30 June 2019



* Data at 30 June 2019.

From MJA

NATIONAL QUEENSLAND FLU SEASON

Queensland's record flu season killed five a week in 2019

By **Stuart Layt**

January 14, 2020 – 9.18pm



Queensland suffered through its worst year for flu for nearly two decades in 2019, with an average of five people a week dying from the disease.



0 Leave a comment

Queensland Health has confirmed 264 people died as a direct result of contracting influenza in 2019, with 68,148 lab-confirmed cases of the disease officially recorded.

That was an increase of over 500 per cent on the previous year's total of 43 deaths, after a relatively quiet flu season in 2018.

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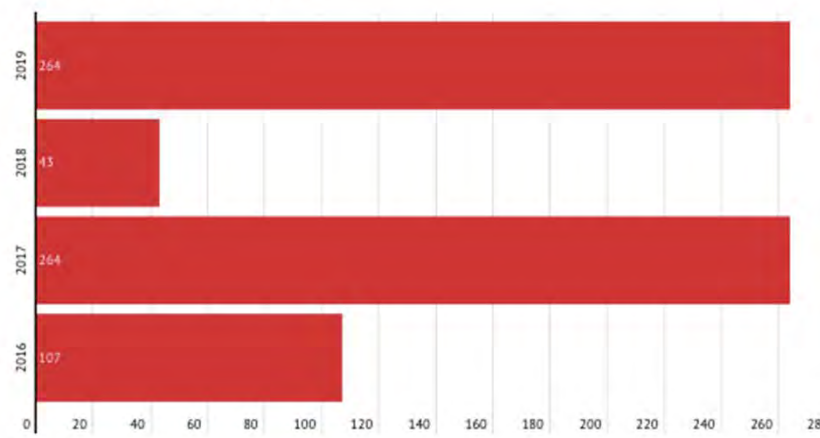
CORONAVIRUS OUTBREAK

Fires and virus could drive nation into recession



Queensland Flu Deaths

Flu-related deaths in Queensland 2016-2019

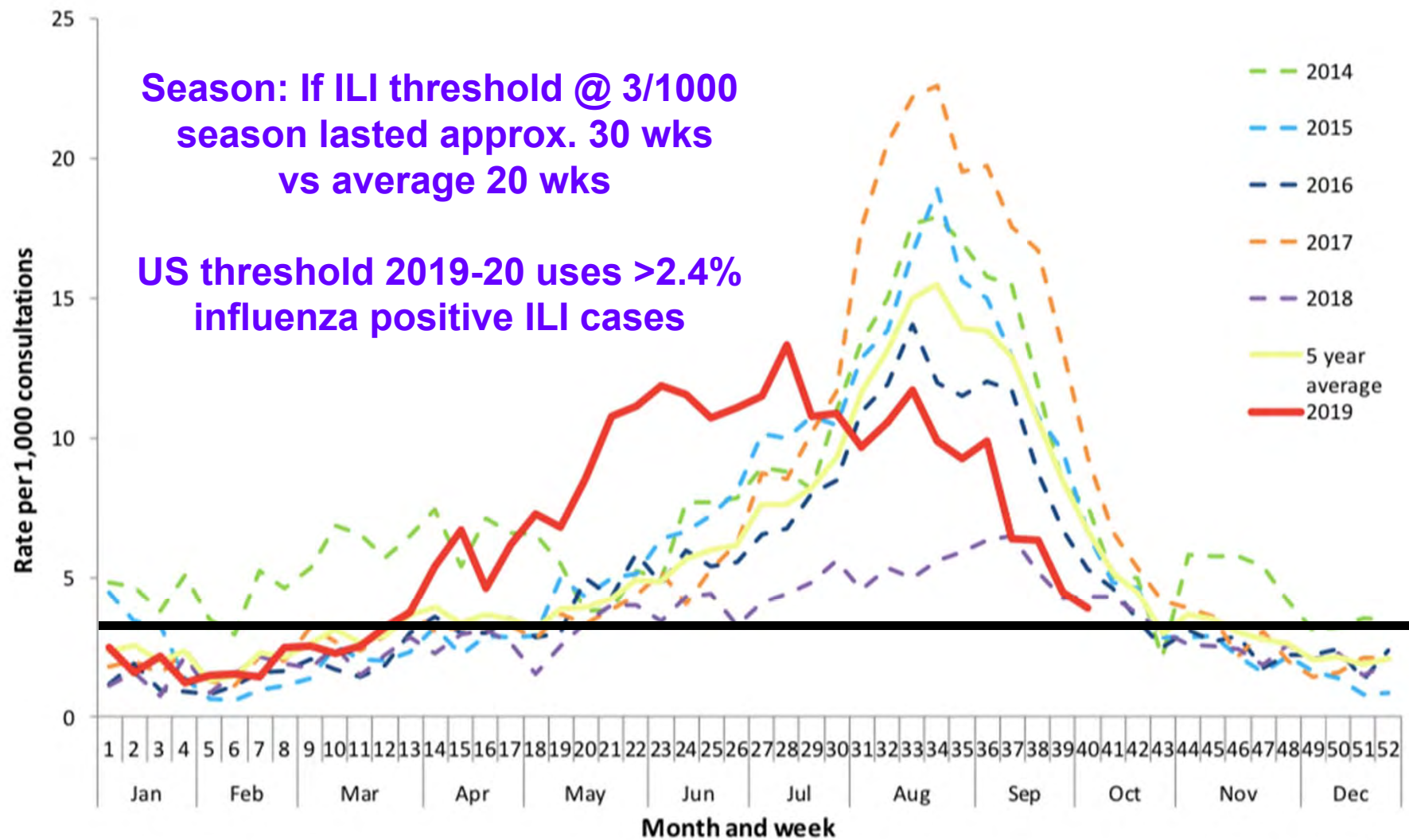


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14 Jan 2020

<https://www.brisbanetimes.com.au/national/queensland/queensland-s-record-flu-season-killed-five-a-week-in-2019-20200114-p53rgv.html>

Influenza-like illness (ILI) 2013-19 in Australia



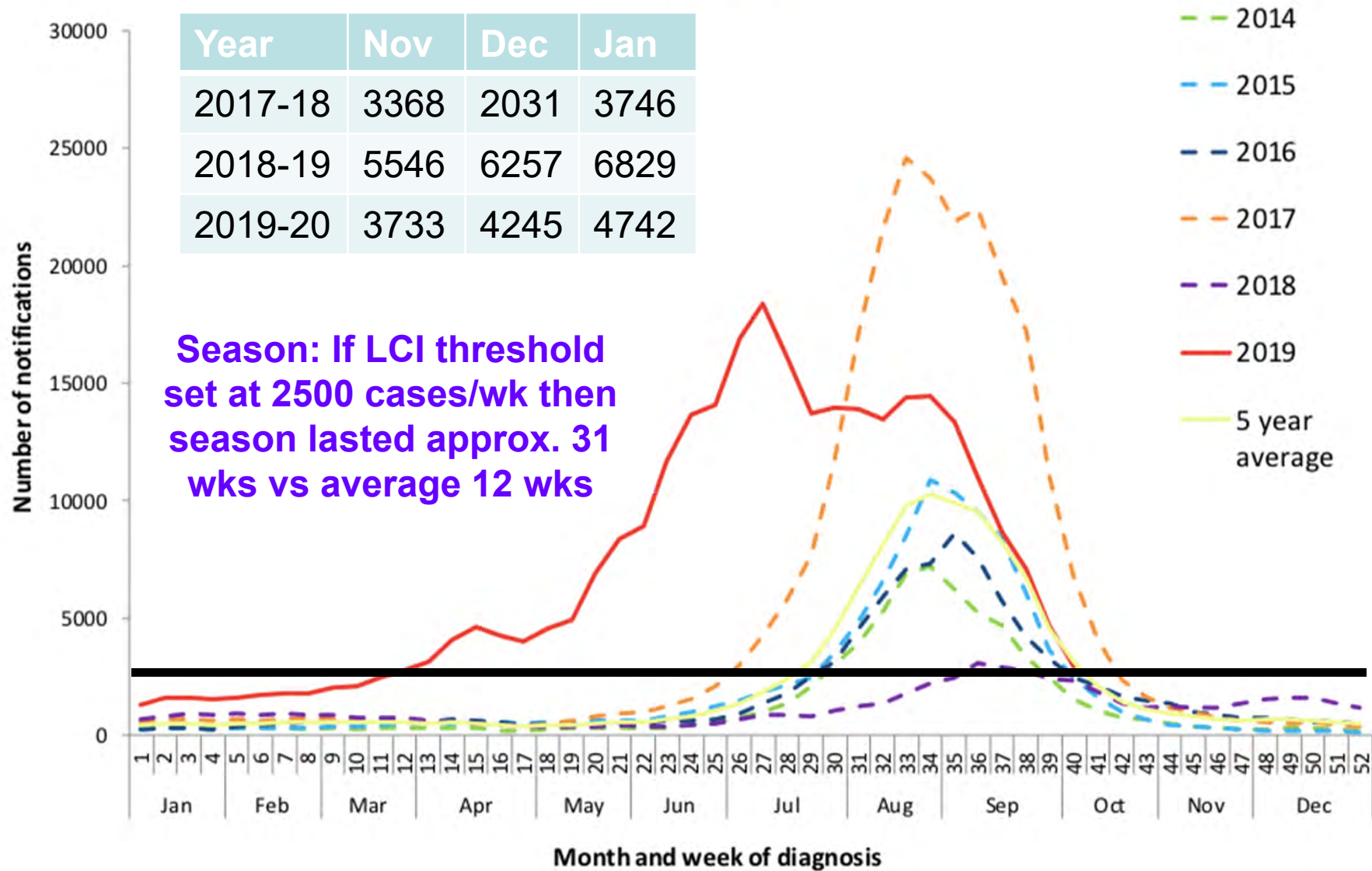
Source: ASPREN

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**AUSTRALIAN INFLUENZA
SURVEILLANCE REPORT**

Lab confirmed influenza in Australia 2013-19

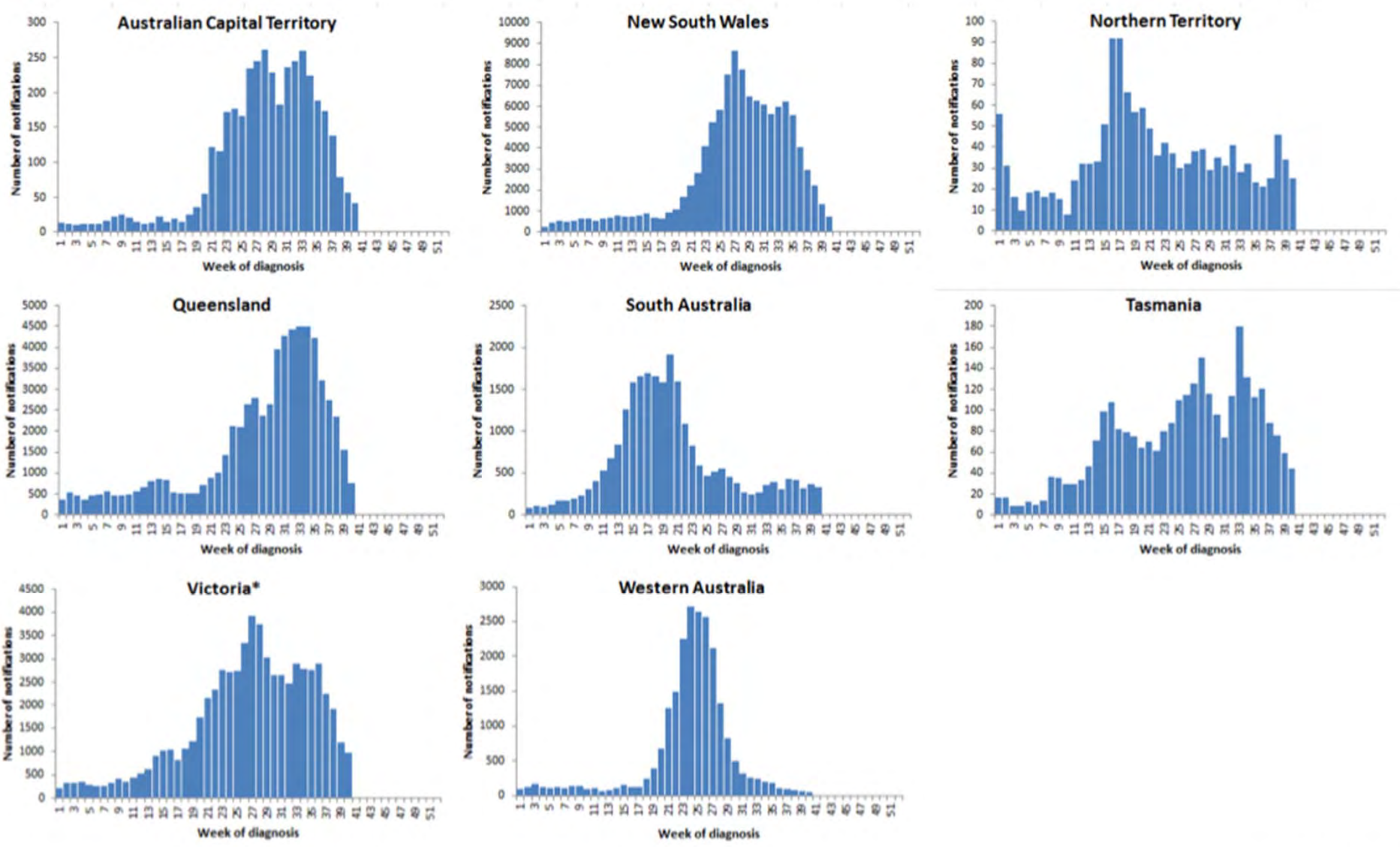


Source: NNDSS
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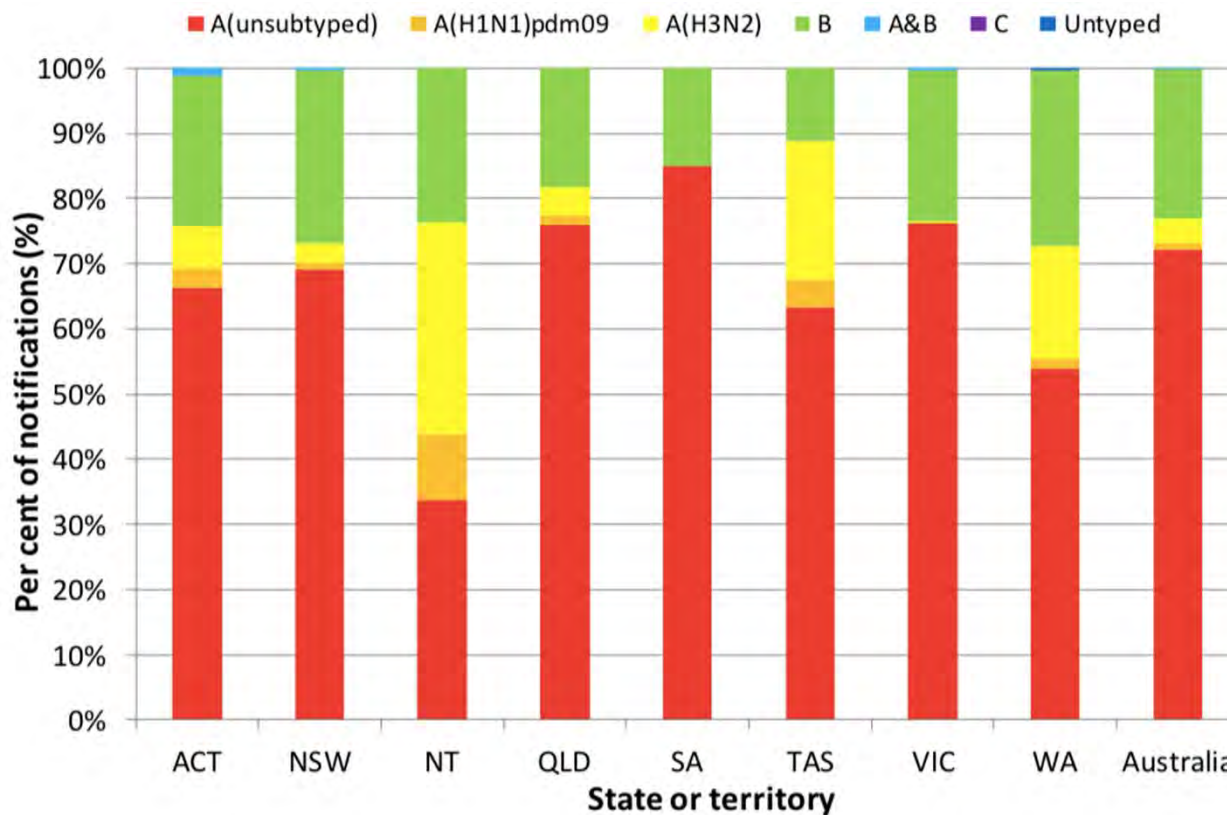
Lab confirmed influenza in Australia 2019 by State

– Early start; Extended season, multiple peaks



NNDSS Laboratory confirmed influenza cases by state 2019

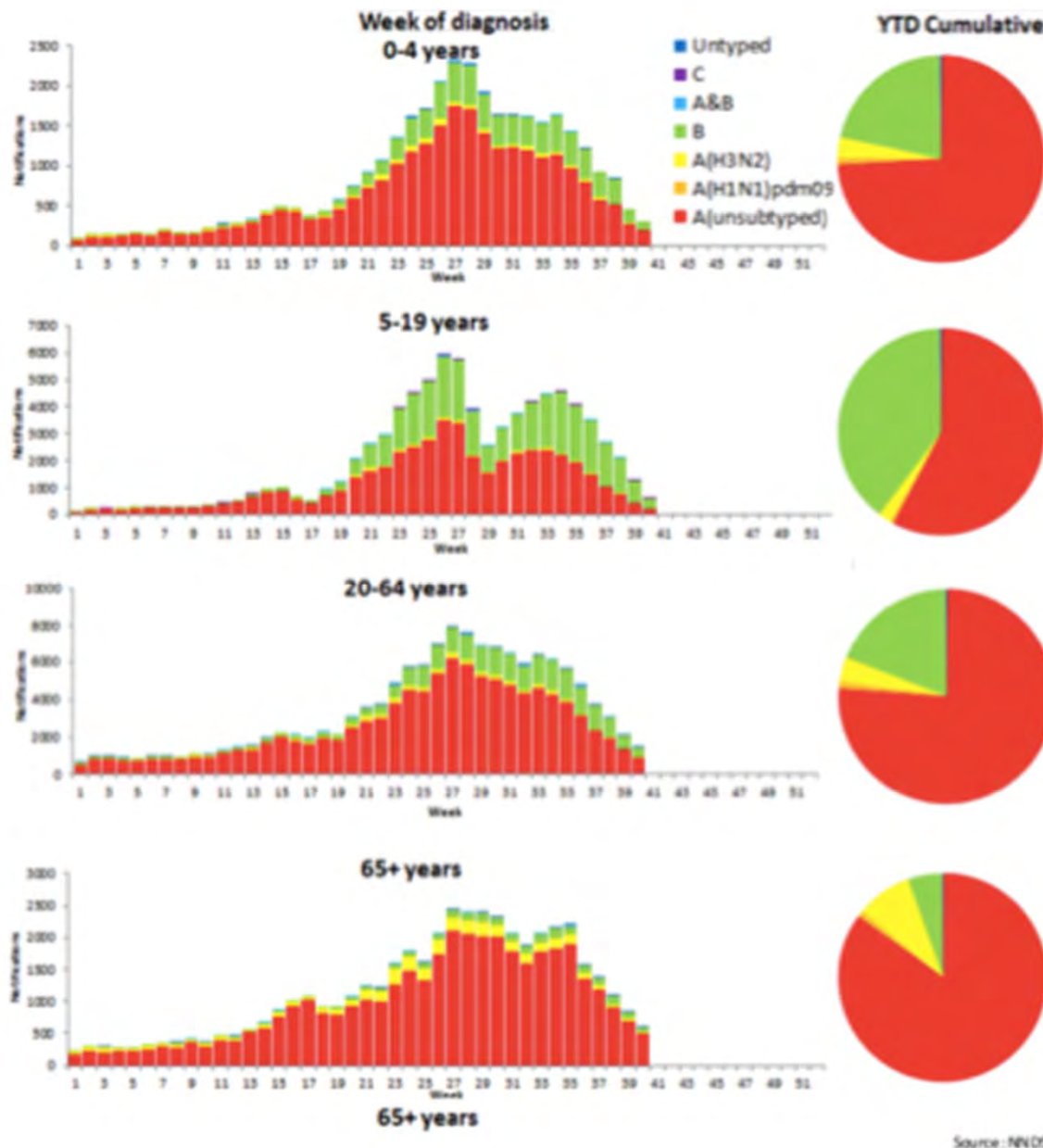
State	#	Rate/ 100K
ACT	4072	967
NSW	116368	1456
NT	1736	701
QLD	68075	1358
SA	27060	1558
Tas	3137	593
Vic	69285	1072
WA	23245	895
Aust	312978	1252



Source: NNDSS



NNDSS Laboratory confirmed influenza cases by age 2019

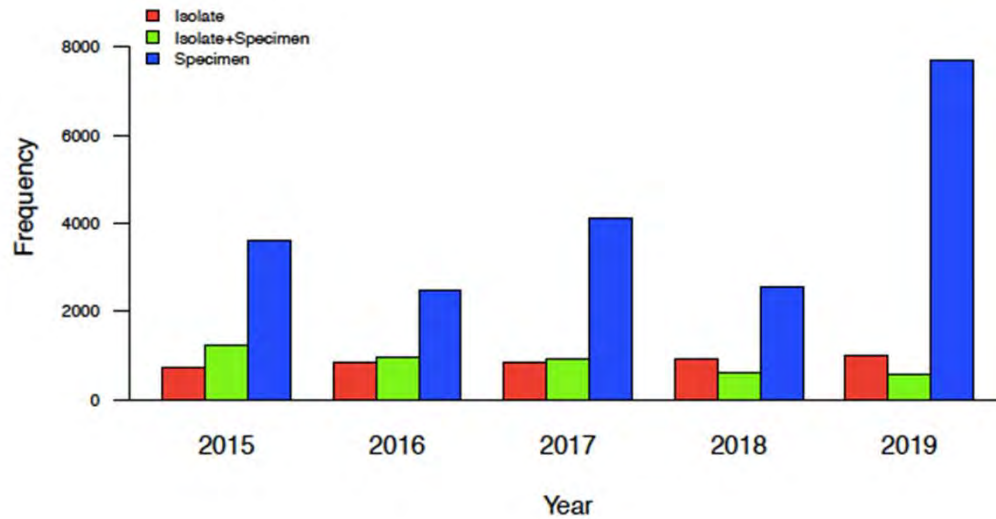


Source: NNDSS

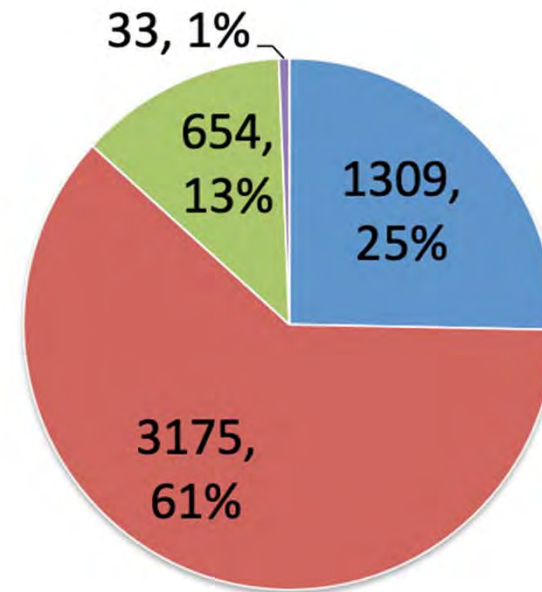
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Sample types received at WHO CC Melbourne



Type/subtype proportions from Australian samples received at WHO CC in 2019

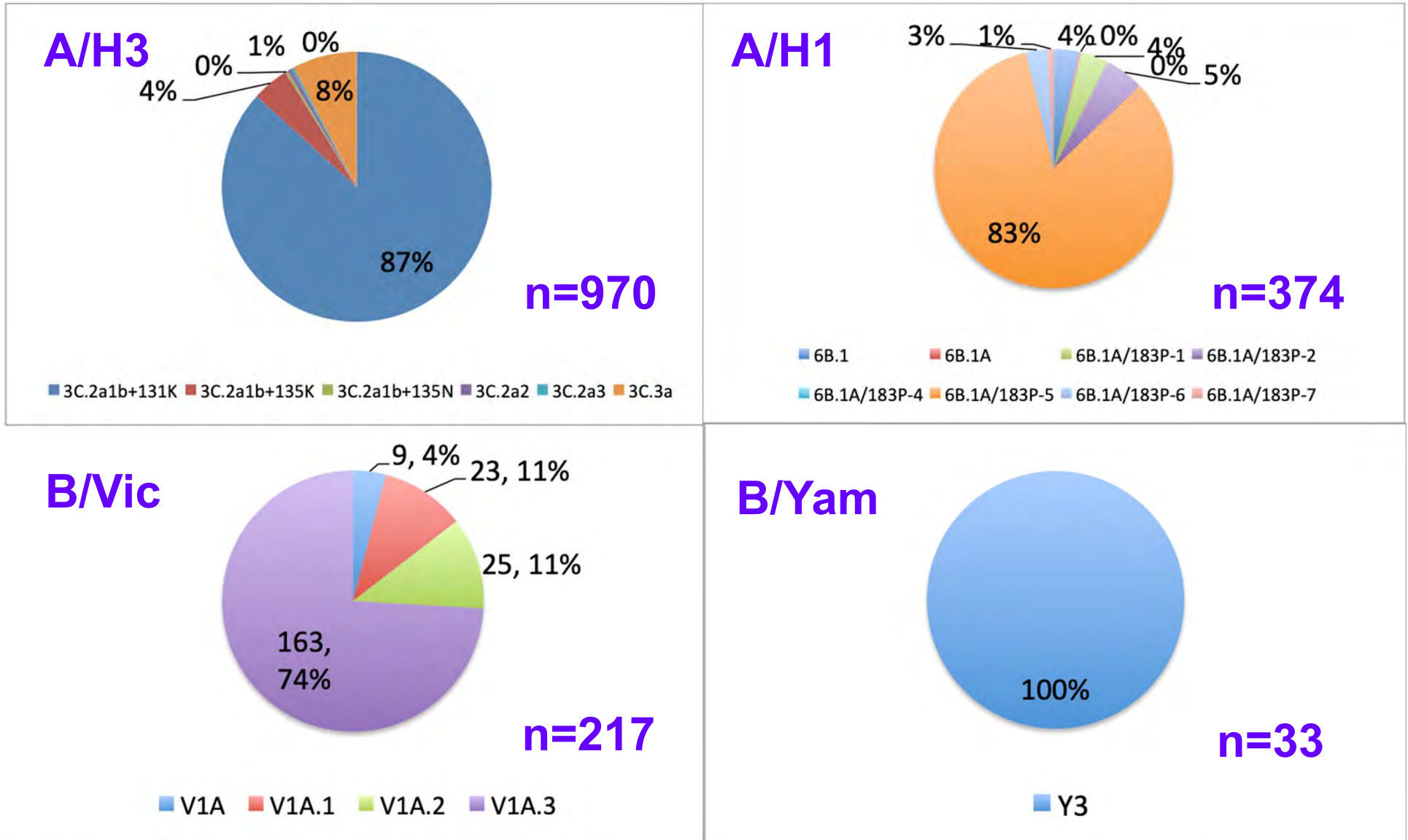


■ H1pdm ■ H3 ■ B/Vic ■ B/Yam

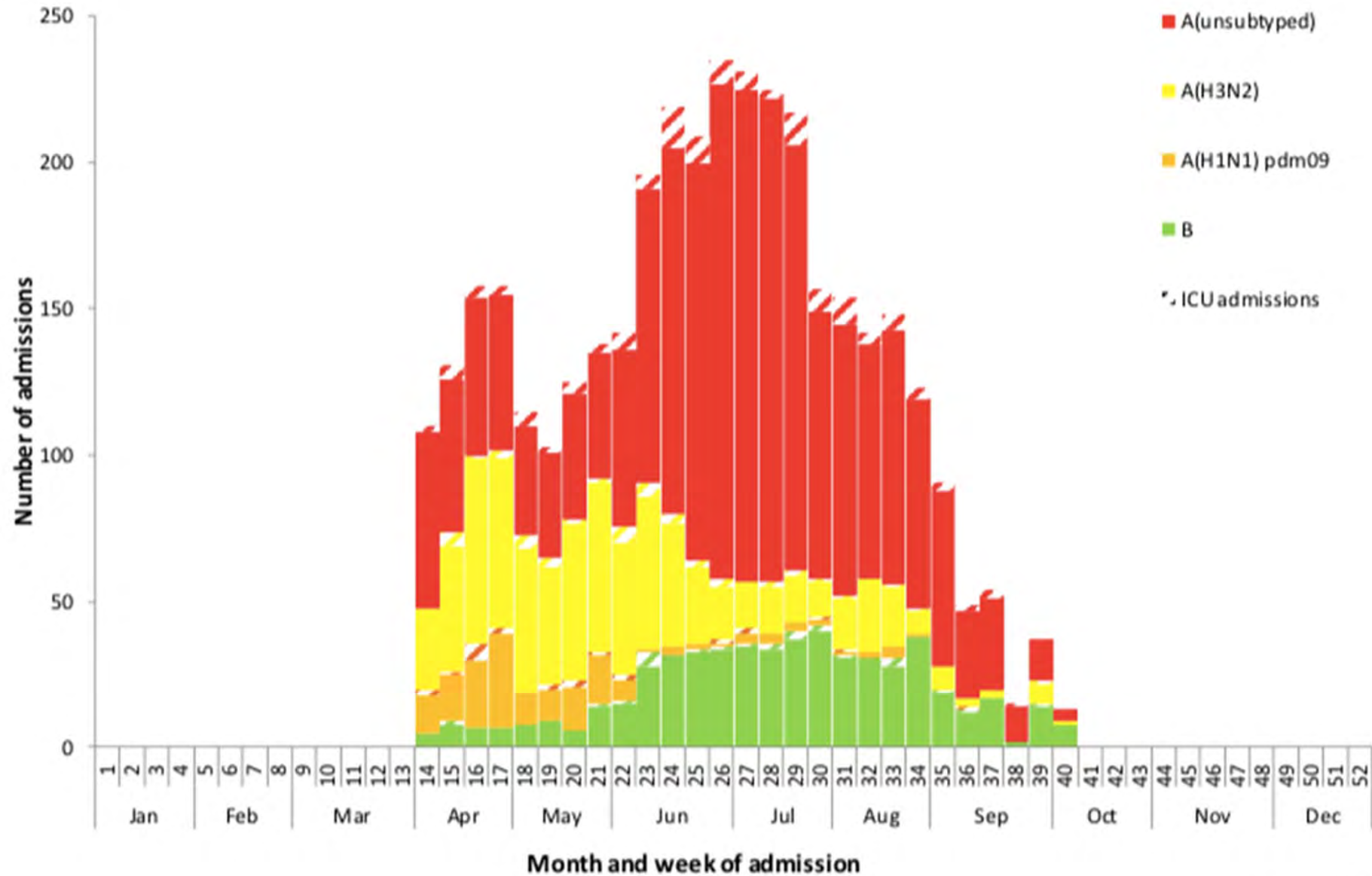


Molecular diversity of Australian influenza viruses in 2019

(Based on Haemagglutinin gene sequencing by WHO CC Melb)



FluCAN hospitalisation data 2019 (1 April-6 October)

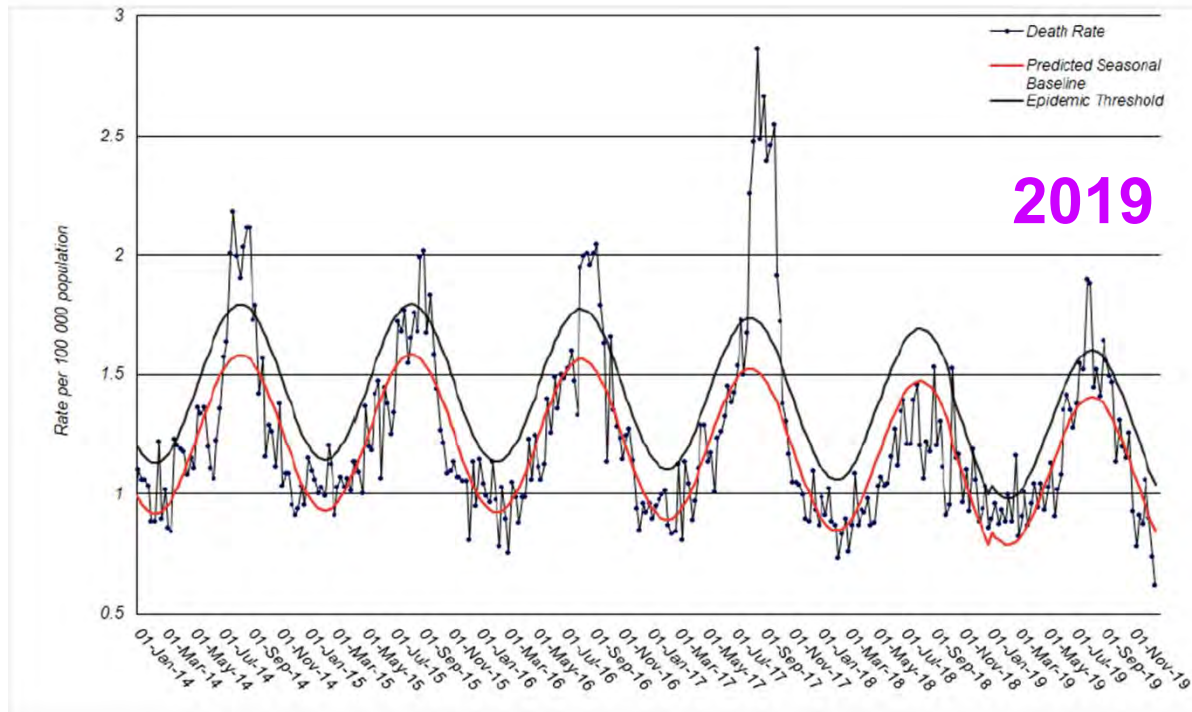


Reported influenza outbreaks in NSW institutions

NSW 2014-2019

Year	2014	2015	2016	2017	2018	2019
No. of outbreaks	122	103	252	543	42	383

Excess deaths in NSW



NNDSS reported influenza associated deaths in Australia

	1 January to 31 December						
	2014	2015	2016	2017	2018	5 year average	2019*
Notifications ^{*†}	67,670	100,556	90,858	251,151	58,858	113,819	307,907
Deaths [§]	189	222	273	1181	148	403	902
Case Fatality Rate	0.28%	0.22%	0.30%	0.47%	0.25%	0.35%	0.29%

•Data on 'Deaths' should always be used with extreme caution as clinical information is not always collected across the various jurisdictions and timely mortality data is not available. These notification data are based on data extracted from the NNDSS on the date indicated above. Due to the dynamic nature of the NNDSS, data on this extract are subject to retrospective revision and may vary from data reported in published NNDSS reports and reports of notification data by states and territories. In general notification data represent only a proportion of the total cases occurring in the community, that is, only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities. The degree of under-representation of all cases is unknown and is most likely variable by disease and jurisdiction. In interpreting these data it is important to note that changes in notifications over time may not solely reflect changes in disease prevalence or incidence. Depending on the disease changes in testing policies; screening programs including the preferential testing of high risk populations; the use of less invasive and more sensitive diagnostic tests; and periodic awareness campaigns, may influence the number of notifications that occur annually.



*Up to 1.12.19
Data kindly supplied by OHP, DoH

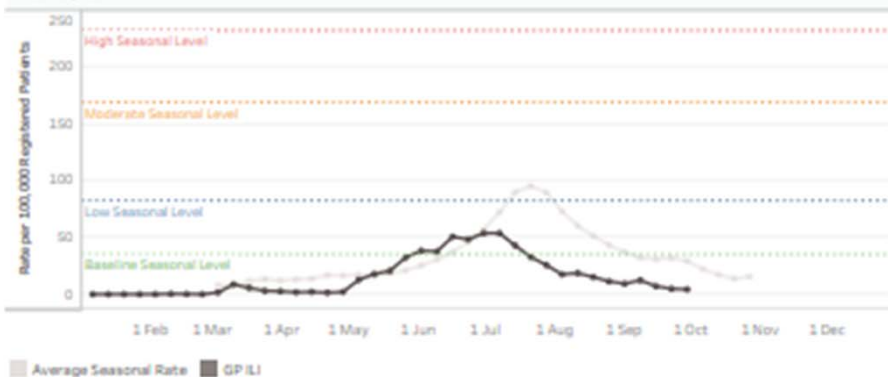
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Week Ending 29 September 2019

National Overview

In the last week of seasonal influenza surveillance for the year, indicators of influenza-like illness (ILI) activity in the community have remained low. Both ILI activity and the rate of people presenting to general practices (GP) with ILI who test positive for influenza virus are below the baseline level. Influenza A(H3N2) and B/Victoria viruses are co-circulating in the community and influenza A viruses are still predominating in hospitals. Virology reports indicate there has been a mutation in the influenza B/Victoria virus strain circulating in New Zealand during the 2019 season. This is expected to reduce the 2019 seasonal vaccine effectiveness for this influenza virus strain.

Weekly General Practice Influenza-like Illness (ILI) Rates To 29 Sep 19



National indicators of community influenza-like illness (ILI) activity have mostly continued to decrease over the past few weeks.

Indicators of severity remain below seasonal baseline levels. Activity in Intensive Care Units is low.

Arrow colour indicates whether the current weekly change is statistically significant.

Arrow colour indicates whether the current weekly change is statistically significant.

Healthline Calls



Hospital Stays



GP Visits



Hospital Influenza



GP Influenza



ICU admissions



ED Visits



ICU Influenza



Activity by DHB

The national rate of General Practice (GP) visits for influenza-like illness (ILI) remains below the seasonal baseline level, and continues to decline. South Canterbury and Capital & Coast DHBs have recorded the highest ILI GP visit rates this week. Rates of Healthline calls for ILI also decreased in the last week. West Coast, Tairāwhiti and Hutt Valley DHBs had the highest rates of Healthline calls this week.

GP Visits (ILI) Rate by DHB - Current Week



Control Measures

The 2019 publicly funded seasonal influenza vaccine contains the following four components (i.e. a quadrivalent vaccine):

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;
- an A/Switzerland/806Q/2017 (H3N2)-like virus;
- a B/Colorado/06/2017-like virus (B/Victoria/2/97 lineage); and
- a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage).

Overseas acute respiratory disease surveillance

- Pacific region:** In Australia, following early, high seasonal influenza and ILI activity in May to July, activity has been continuing to decline through September.^{1,2} Over recent surveillance weeks, activity decreased in most states and territories, except for some regions of the Northern Territory and Western Australia. Nationally, influenza A(H3N2) virus continues to predominate, while the proportion of cases attributed to influenza B viruses has been steadily increasing through August and September. Circulating influenza A(H1N1)pdm09 and influenza B/Yamagata-lineage viruses have been well matched to the 2019 vaccine while some A(H3N2) and B/Victoria-lineage viruses have been less well matched, although overall vaccine effectiveness is reportedly good from preliminary estimates. Clinical severity for the season to date is low. Outbreaks of influenza A and B are continuing in New Caledonia.³
- Asia:** Influenza activity remained low across Southern Asia, except for continued high activity in Bhutan and increased activity in Nepal (both A(H3N2) and B/Victoria lineage).⁴ Activity was low in most of South East Asia, although moderate detections of predominantly H(H1N1)pdm09 and B viruses continued in Malaysia and Myanmar, and all seasonal sub-types co-circulated in Thailand.
- South and Central America:** Activity in South America was low, except for an increase in predominantly B viruses in Chile.⁵ In Central America, El Salvador reported an increase in A(H1N1)pdm09.
- Africa:** Currently low influenza activity overall.¹ Activity in South Africa returned to below the seasonal threshold.
- Northern Hemisphere:** Currently low influenza activity overall.¹
- Emerging diseases:** In 2019, ongoing detections of Middle East Respiratory Syndrome coronavirus (MERS-CoV) in the Middle East and human infection with avian influenza A(H7N9), A(H5N2) and A(H5N6) in China have been reported (associated with exposures to camels and birds, respectively).^{4,5} These emerging viruses (MERS-CoV, A(H7N9), A(H5N2) and A(H5N6)) are not known to spread easily from person-to-person at present and are classified by the WHO as being of low risk of international spread.^{5,6}

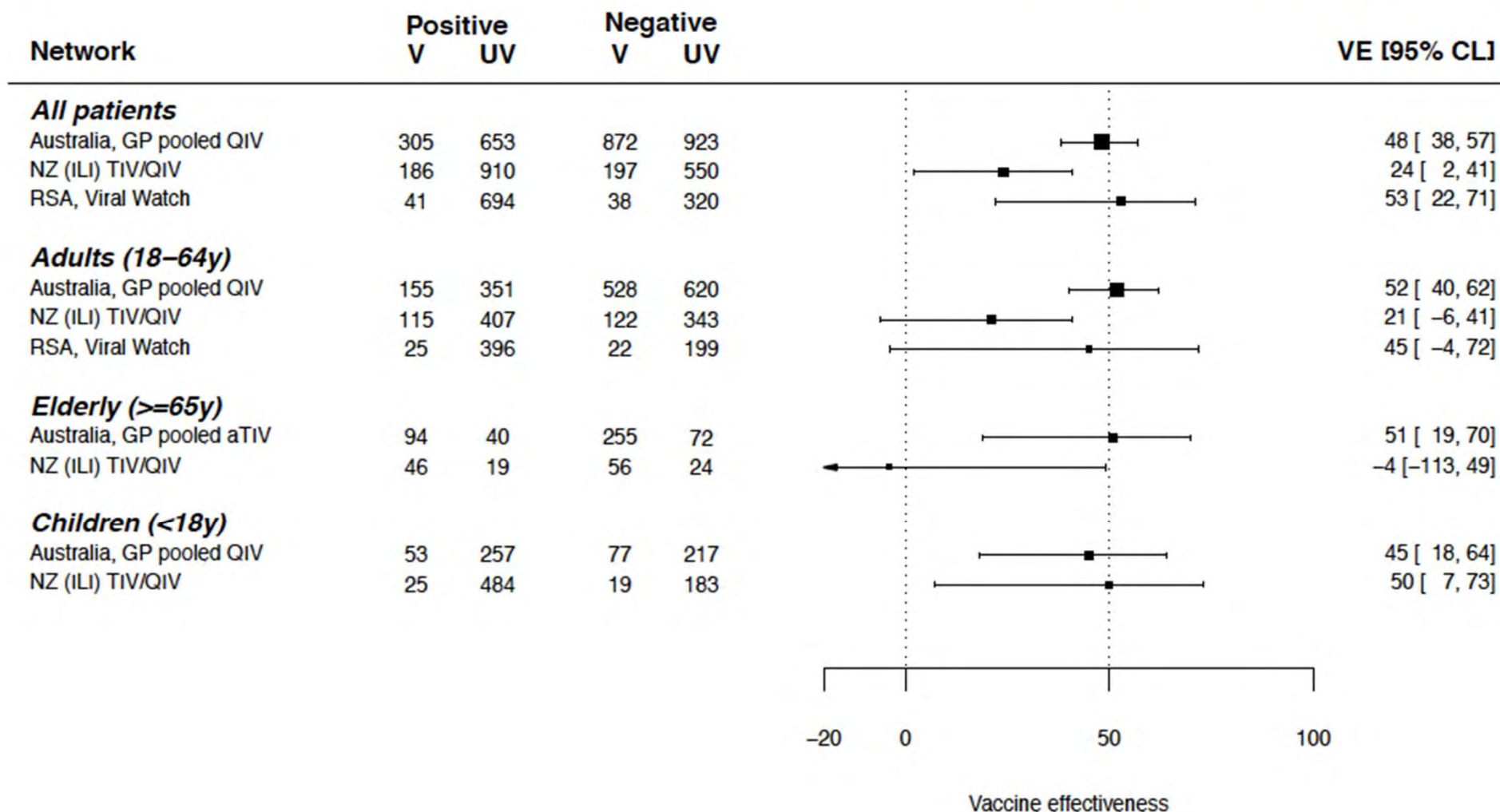
Further information on overseas acute respiratory disease activity:

- WHO Global Flu Update: www.who.int/influenza/surveillance_monitoring/updates/latest_update_GFP_surveillance/en/ (accessed 2/10/19)
- Australia: www.health.gov.au/flu-report (accessed 2/10/2019)
- Pacific: www.apc.int/phd/epidemics/ (accessed 2/10/19)
- WHO Emergency Preparedness, response: www.who.int/csr/don/archive/year/2019/en/ (accessed 2/10/19)
- WHO Avian and other zoonotic influenza: www.who.int/influenza/human_animal_interface/en/ (accessed 2/10/19)
- WHO Global Summary and Assessment of Risk: <https://apps.who.int/iris/bitstream/handle/10665/326126/WHO-MERS-R4-19.1-eng.pdf?ua=1> (accessed 2/10/19)

Vaccine effectiveness for Australia 2019 GIVE report (interim estimates)

September 2019

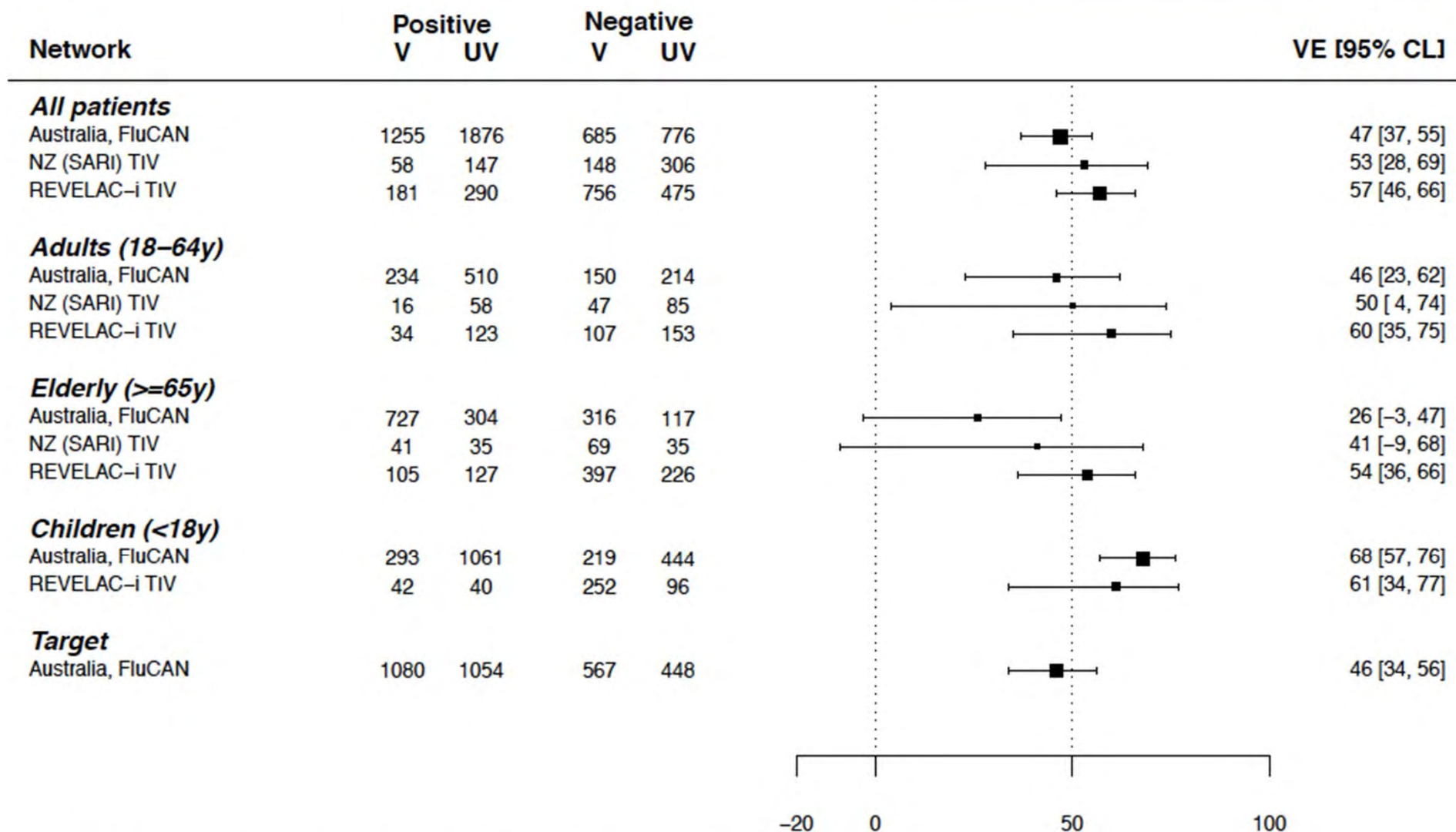
Figure 1. Interim 2019 southern hemisphere VE against influenza A&B, outpatients



Vaccine effectiveness for Australia 2019

GIVE report (interim estimates)

Figure 2. Interim 2019 southern hemisphere VE against influenza A&B, hospitalised patients

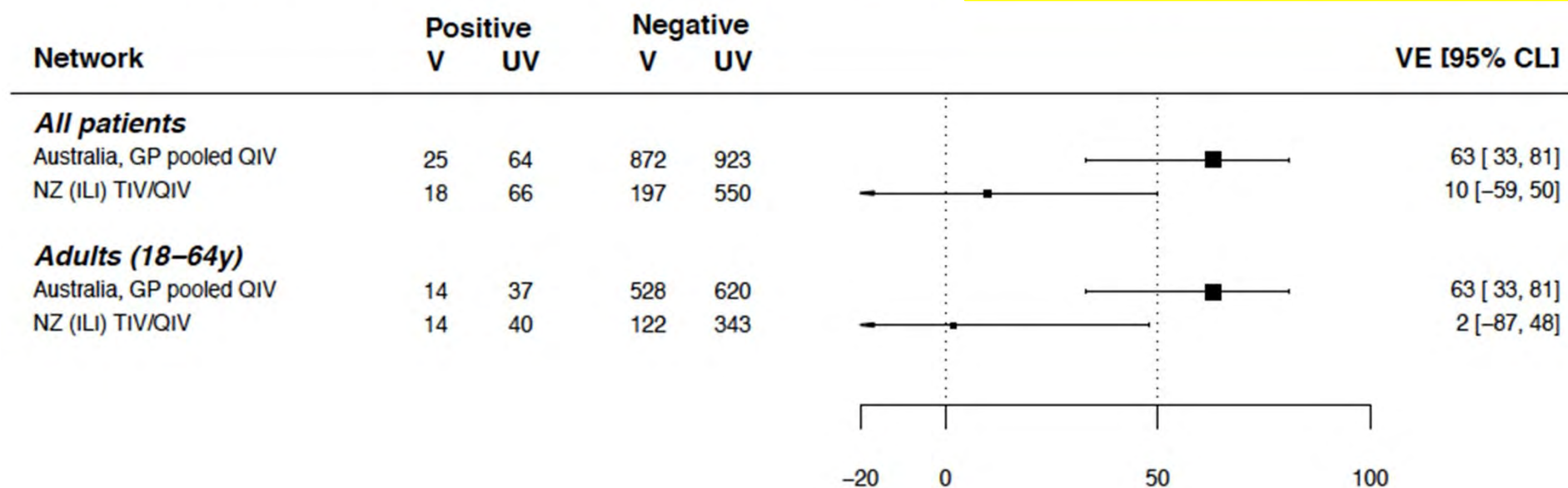


Notes: Elderly Australians received high dose or adjuvanted vaccine under the national program

Vaccine effectiveness for Australia 2019 GIVE report (interim estimates)

September 2019

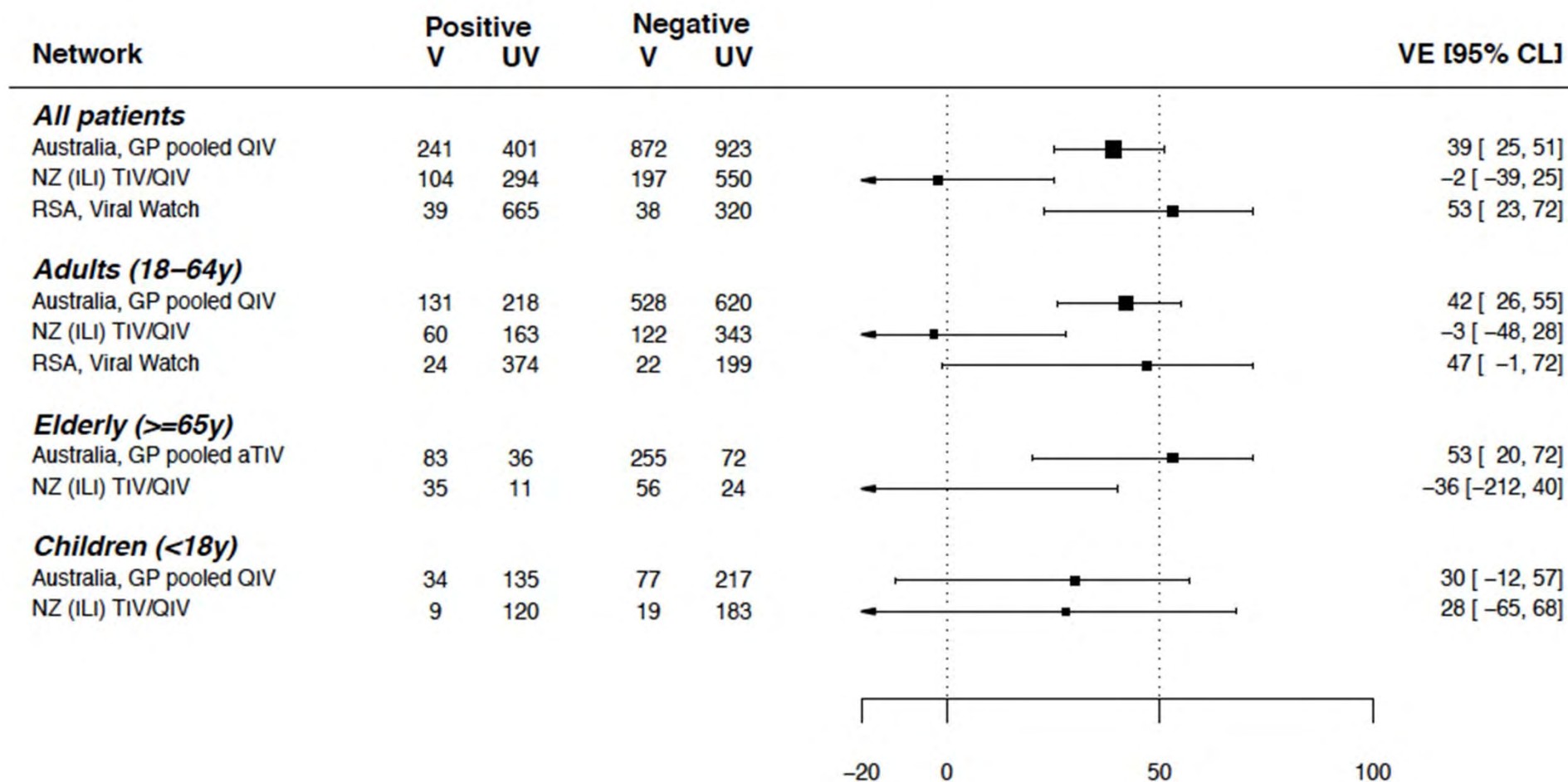
Figure 5. Interim 2019 southern hemisphere VE against influenza A(H1N1)pdm09, outpatients



Vaccine effectiveness for Australia 2019 GIVE report (interim estimates)

September 2019

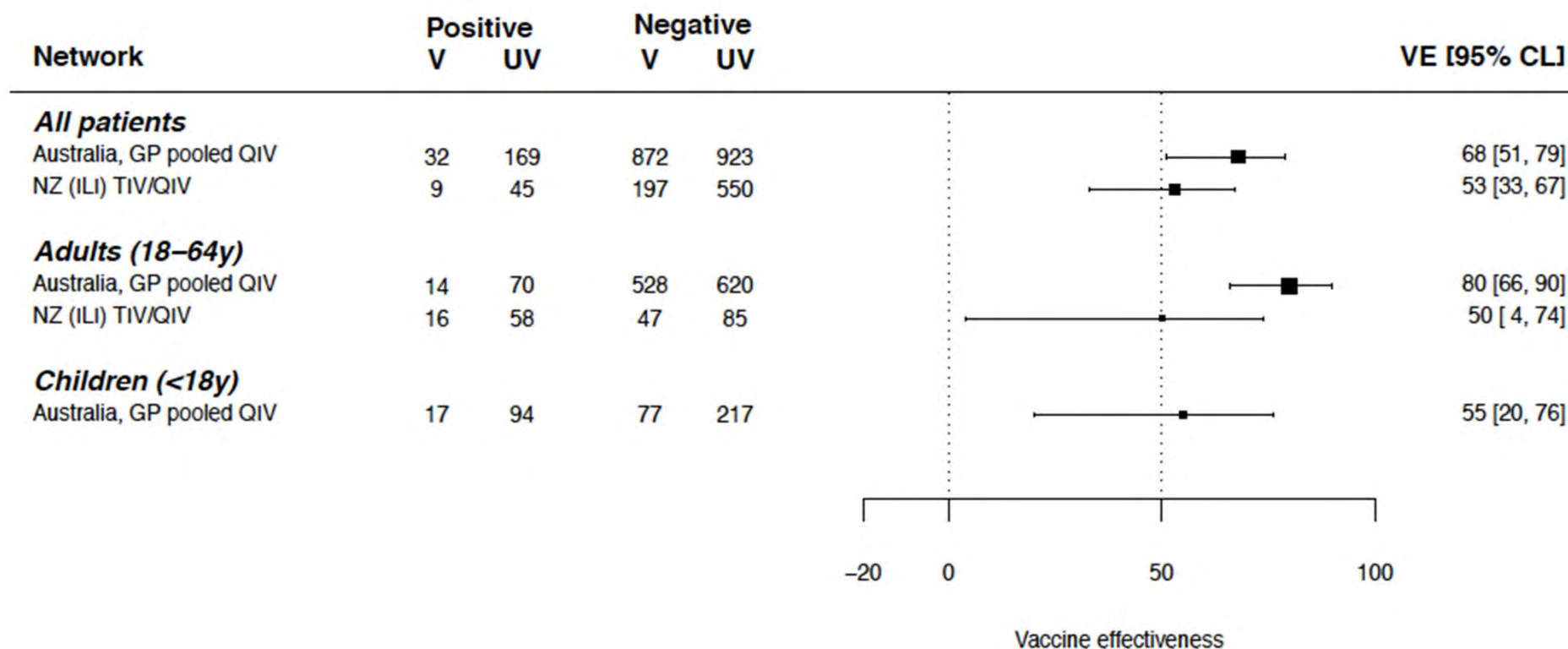
Figure 11. Interim 2019 southern hemisphere VE against influenza A(H3N2), outpatients



Vaccine effectiveness for Australia 2019 GIVE report (interim estimates)

September 2019

Figure 18. Interim 2019 southern hemisphere VE against influenza B, outpatients



Influenza vaccines for Australia and NZ in 2020

- **H1N1pdm – A/Brisbane/02/2018-like**
- **H3 – A/South Australia/34/2019-like**

Trivalent vaccine:

- **B – B/Washington/02/2019-like (B/Vic)**

Quadrivalent vaccine:

- **B – B/Phuket/3073/2013-like (B/Yam)**
- **B – B/Washington/02/2019-like (B/Vic)**

***Changes to 2019 recommendations**



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FEATURE

‘Worthwhile to consider’: Does the world need a pentavalent flu vaccine?

December 10, 2019

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“Influenza vaccine is effective at preventing influenza illness, but protection against H3N2 viruses remains a challenge compared to that achieved for H1N1 and B viruses,” Atmar told Healio.

In their commentary, Atmar and Keitel suggest adding a second H3N2 strain to the seasonal influenza vaccine, “an approach taken in some veterinary vaccines,” Atmar said.

Atmar noted that a second influenza B component was added to the seasonal vaccine to make it quadrivalent based upon the experience that the lineage of the predominant circulating B viruses was different than that in the trivalent vaccine about 50% of the time.

“That said, there are significant logistical issues that need to be considered, including the challenges that manufacturers would face producing a pentavalent vaccine,” he said. “We don’t know that this approach will improve our ability to select strains from clades of H3N2 viruses that subsequently circulate, but we thought it was worthwhile to consider.”

Developing a seasonal vaccine that provides longer lasting and wider protection has long been a goal of researchers.

Commentary by: Robert L Atmar, Wendy A Keitel Baylor College of Medicine, Houston, Texas, USA The Journal of Infectious Diseases, https://doi.org/10.1093/infdis/jiz54



An early start of the 2020 Australian Influenza season?



› **LATEST NEWS** arsary of Trafficking Victims Protection Act of 2000

Proclamation on Suspension of Entry as Immigrants and Nonimmigrants of Pers

Timeline

U.S. President Trump's Remarks at White House Summit on Human Trafficking: 20th Anniversary of Trafficking Victims Protection Act of 2000

12:50 PM AEDT

Proclamation on Suspension of Entry as Immigrants and Nonimmigrants of Persons who Pose a Risk of Transmitting 2019 Novel Coronavirus

12:20 PM AEDT

Grand designs in fine fashion parade

12:06 PM AEDT

Government's cashless-debit scheme with big banks is a shameless attempt to distract from need for Newstart

Politics DECEMBER 19, 2019 11:28 AM AEDT

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Influenza Spike in Central Australia

Department of Health

Central Australians are being urged to protect themselves against influenza even though it is late in the flu season.

Over the past three weeks there has been an unseasonal increase in influenza cases in the centre and the Central Australia Health Service is asking local residents to be alert to the possibility of flu in your community.

"Cases were first seen in Alice Springs but are now spreading to remote areas," said Dr Belinda Greenwood Smith, Coordinator, Public Health Unit – Disease Control.

"This is very late in the year compared to our usual season, but it is never too late to get vaccinated, particularly

19 December 2019



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The NH 2019-20 influenza season (so far)



US influenza activity at high levels

The screenshot shows the ABC News website interface. At the top, there is a navigation bar with links for Traffic, MeTV, Mobile App, About Us, Contact Us, and Community, along with social media icons for Twitter, Facebook, and Instagram. Below this is a yellow header with the ABC COLUMBIA logo and menu items for NEWS, SPORTS, WEATHER, PROGRAMMING, and CONTESTS. A search bar is located on the right side of the header.

High flu activity spreads across US as virus claims 14 more children

By Erin Schumaker

Feb 1, 2020 11:55 AM EST by ABC News

HIGH FLU-LIKE ACTIVITY

32 Pediatric Deaths

Source: CDC

abc NEWS

Full season is in full swing, with nearly every state reporting high influenza activity and 14 more children dying this week, the Centers for Disease Control and Prevention reported.

2020_01_20_in....png ^ | flu-infographic....png ^

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Weather



Clear

48°

Feels Like 48°

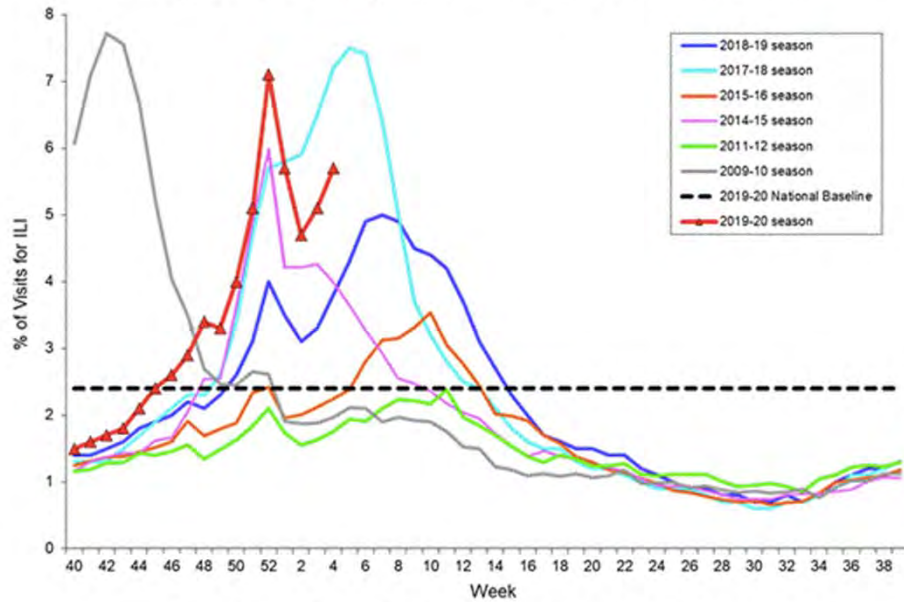
Most Popular

- 1 Study shows SC city's water among the most toxic in country
- 2 2 dead, 6 injured in shooting at SC nightclub
- 3 Breaking: Five dead in Helicopter crash in California, Kobe Bryant reportedly among dead



CDC data on influenza in USA

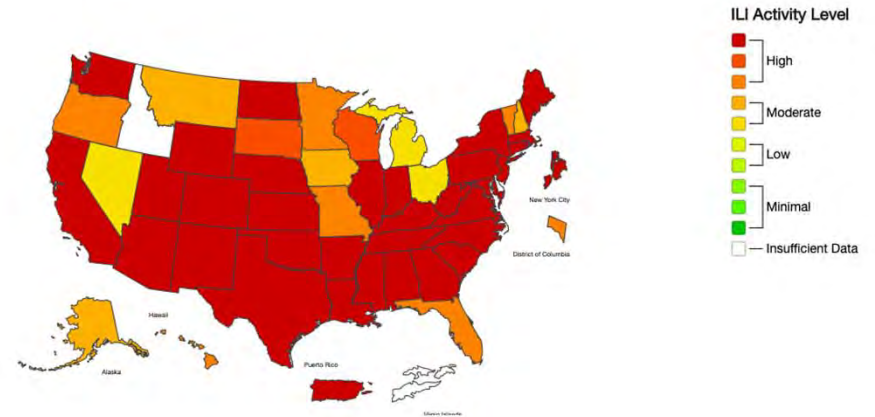
Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2019-2020 and Selected Previous Seasons



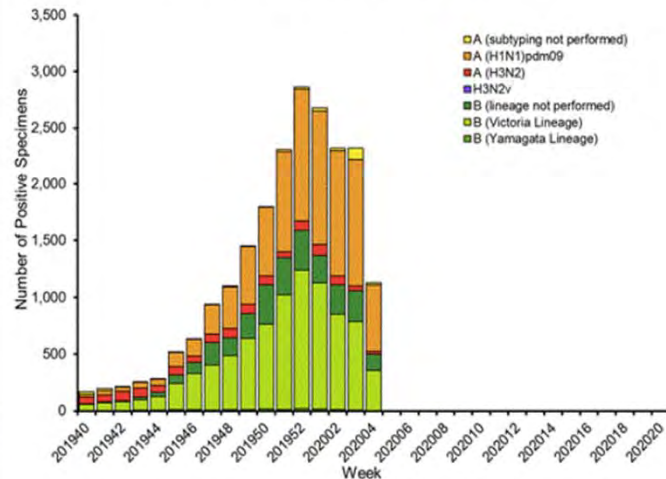
A Weekly Influenza Surveillance Report Prepared by the Influenza Division

Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet

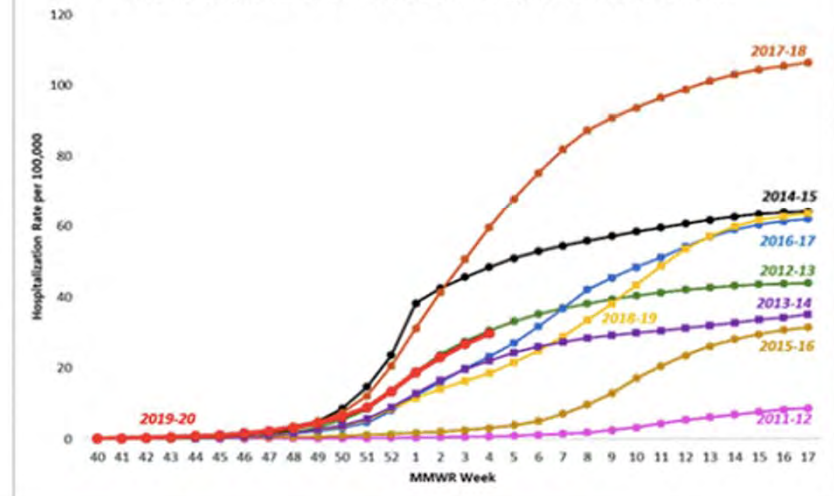
2019-20 Influenza Season Week 4 ending Jan 25, 2020



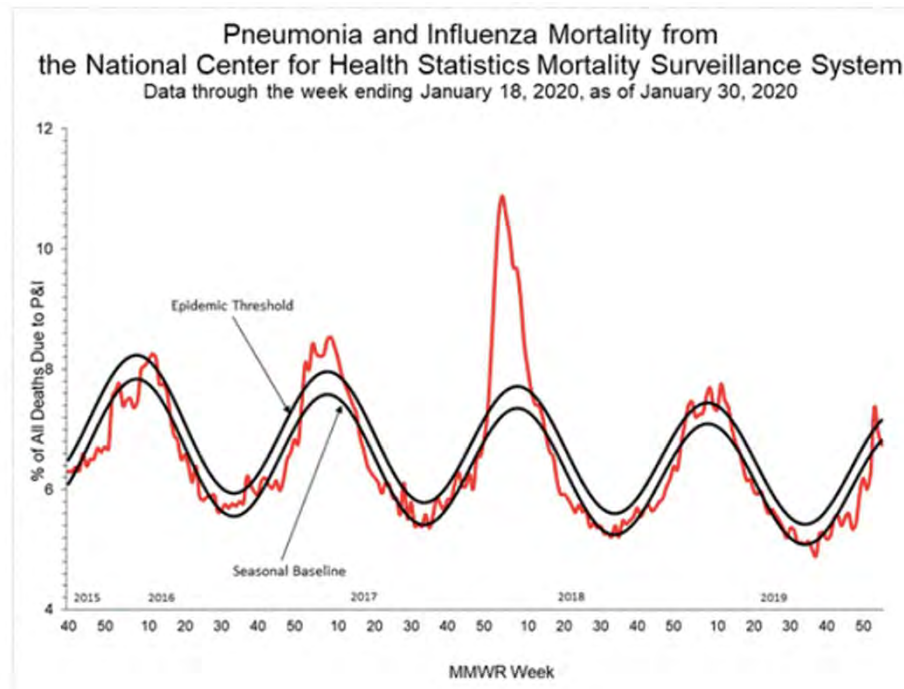
Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, National Summary, 2019-2020 Season



Cumulative Rate of Laboratory-Confirmed Influenza Hospitalizations among cases of all ages, 2011-2012 to 2019-20

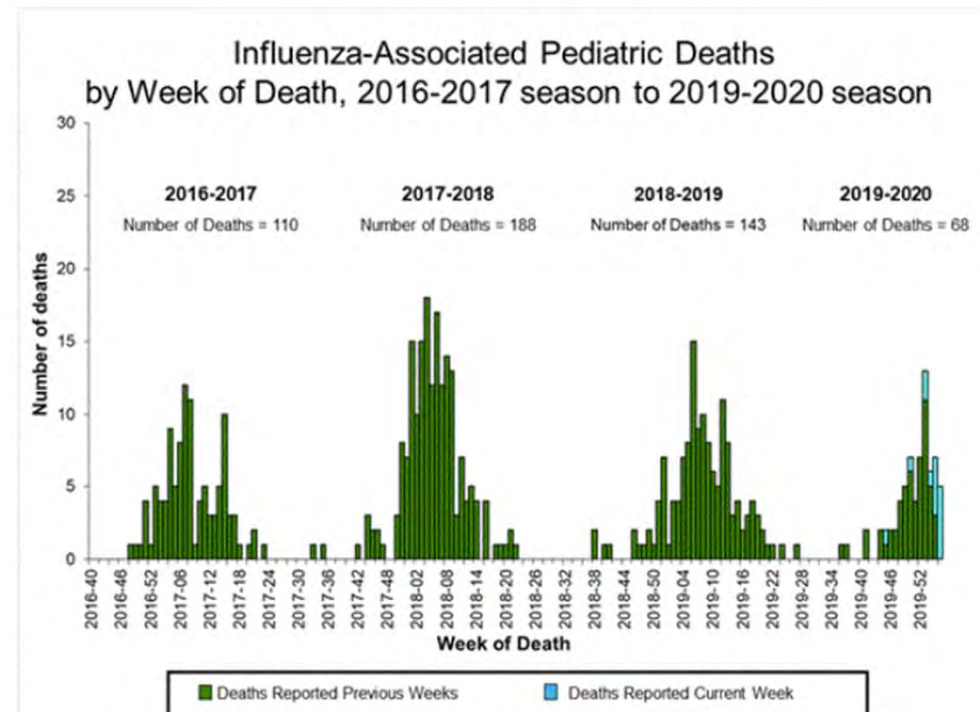


USA influenza related deaths



“So far, 10,000 people have died and 180,000 people have been hospitalized during the 2019-2020 flu season, according to preliminary estimates from the CDC”

As at 24 Jan 2020: 173.3M doses of influenza vaccine distributed (sufficient for 53% of population)



US “real time” tracking of influenza using smart thermometers - Kinsa



The New York Times

GLOBAL HEALTH

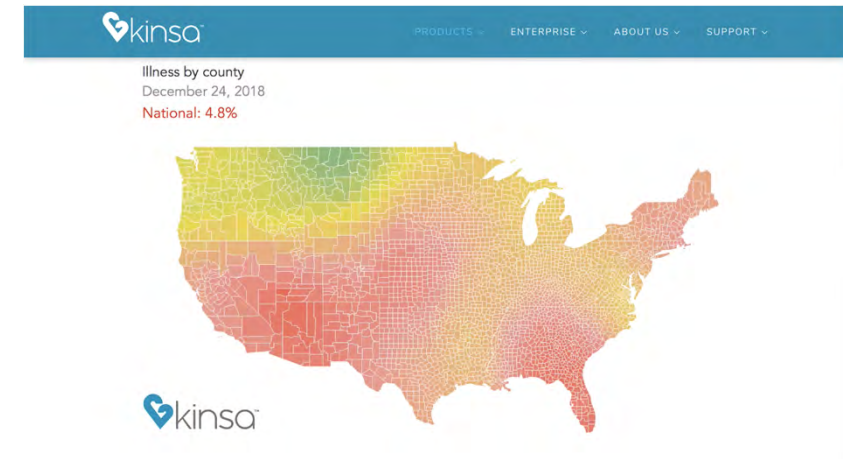
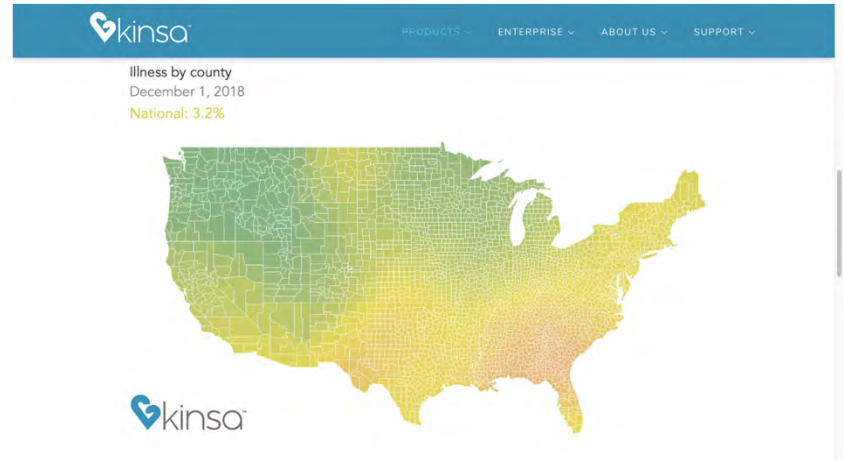
‘Smart Thermometers’ Track Flu Season in Real Time



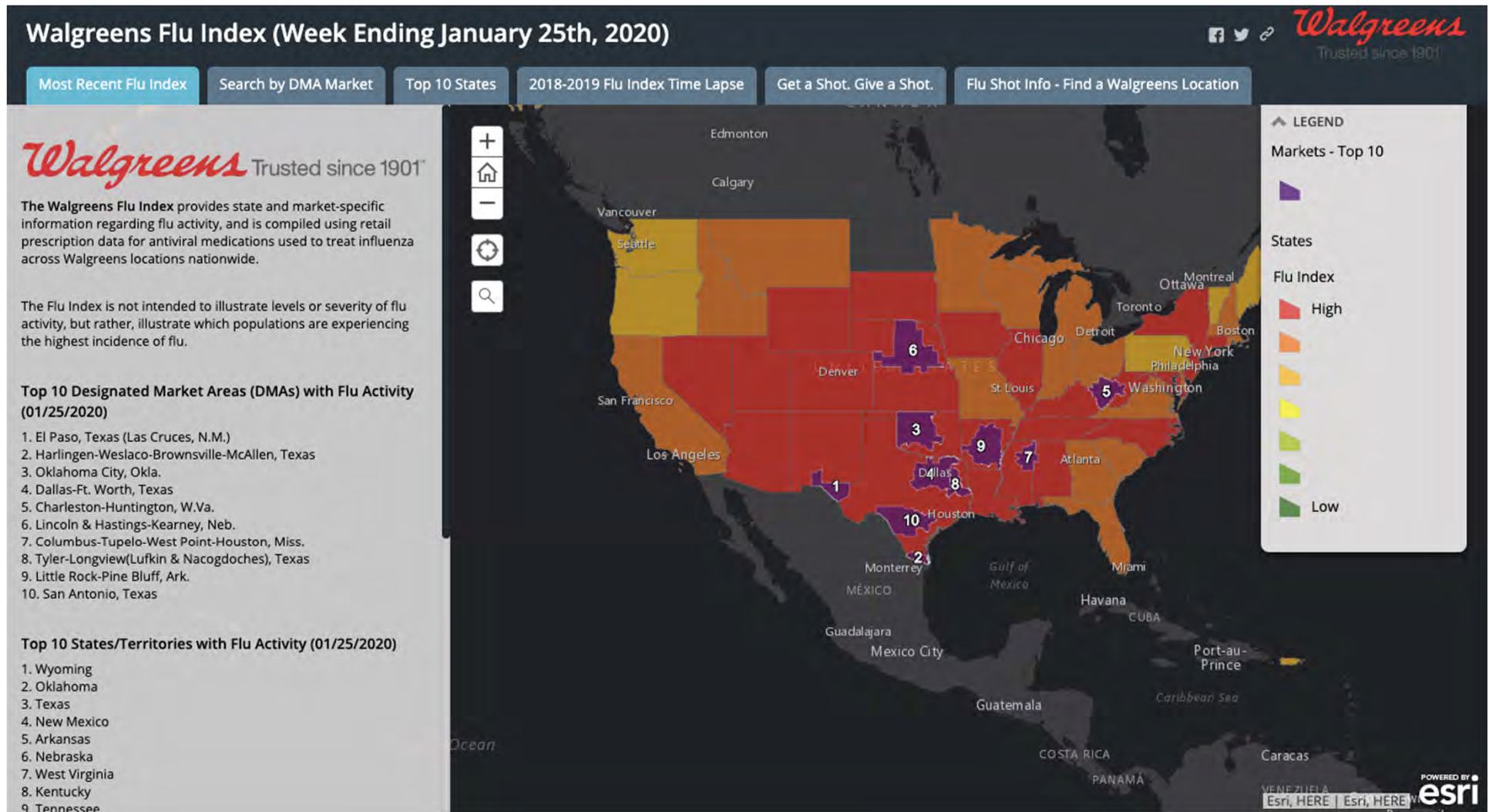
A flu patient at Palomar Medical Center in Escondido, Calif. New “smart thermometers” are tracking the spread of flu, which has struck California especially hard this year. Gregory Bull/Associated Press



<https://www.kinsahealth.co/products/health-map/>



Walgreens Flu Index – based on sales of antiviral medications at their stores in the USA



<https://walgreens.maps.arcgis.com/apps/MapSeries/index.html?appid=40d0763cd3cc42428b26f85202108469&rel=0>

WHO Collaborating Centre
for Reference and
Research on Influenza
VIDRL

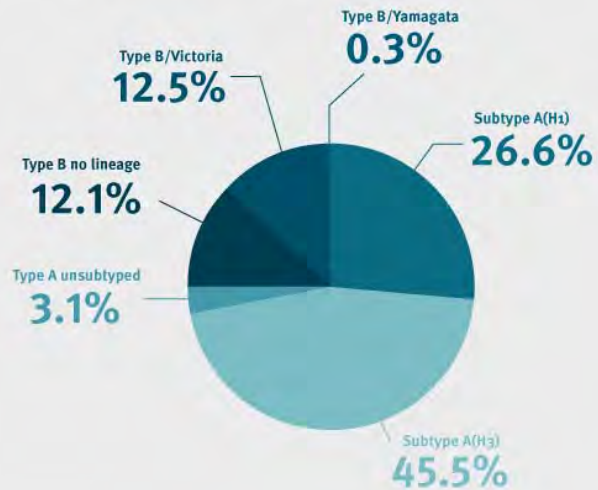
Influenza in Europe

Data from EU and EEA countries for the 2019–2020 season
Week 3 (14 Jan–20 Jan 2020)



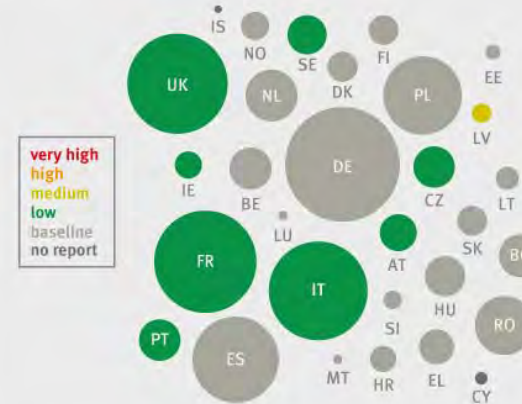
Influenza viruses circulating in 2019–2020

Only sentinel specimens are included



Influenza intensity in week 3

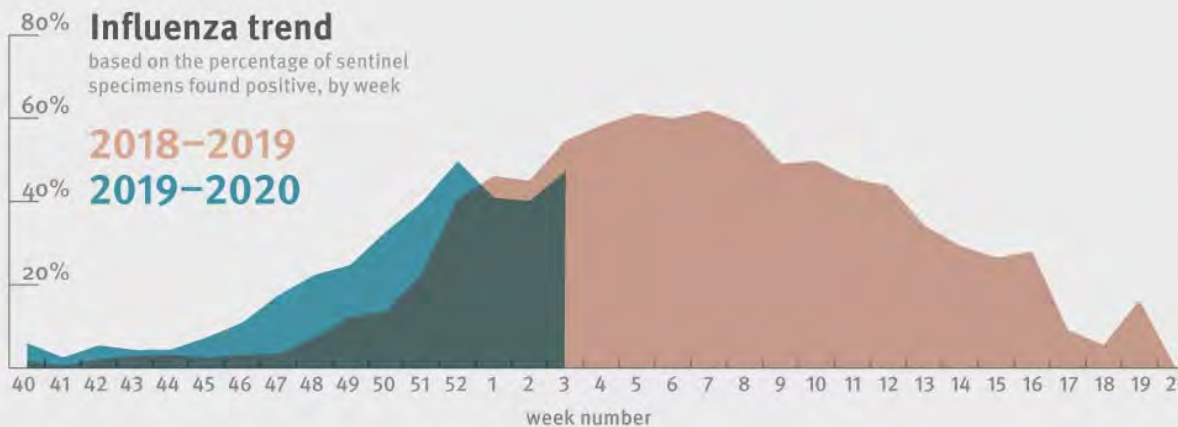
based on sentinel reports of influenza-like illness and/or acute respiratory infections



Bubble size is indicative of country population

Influenza trend

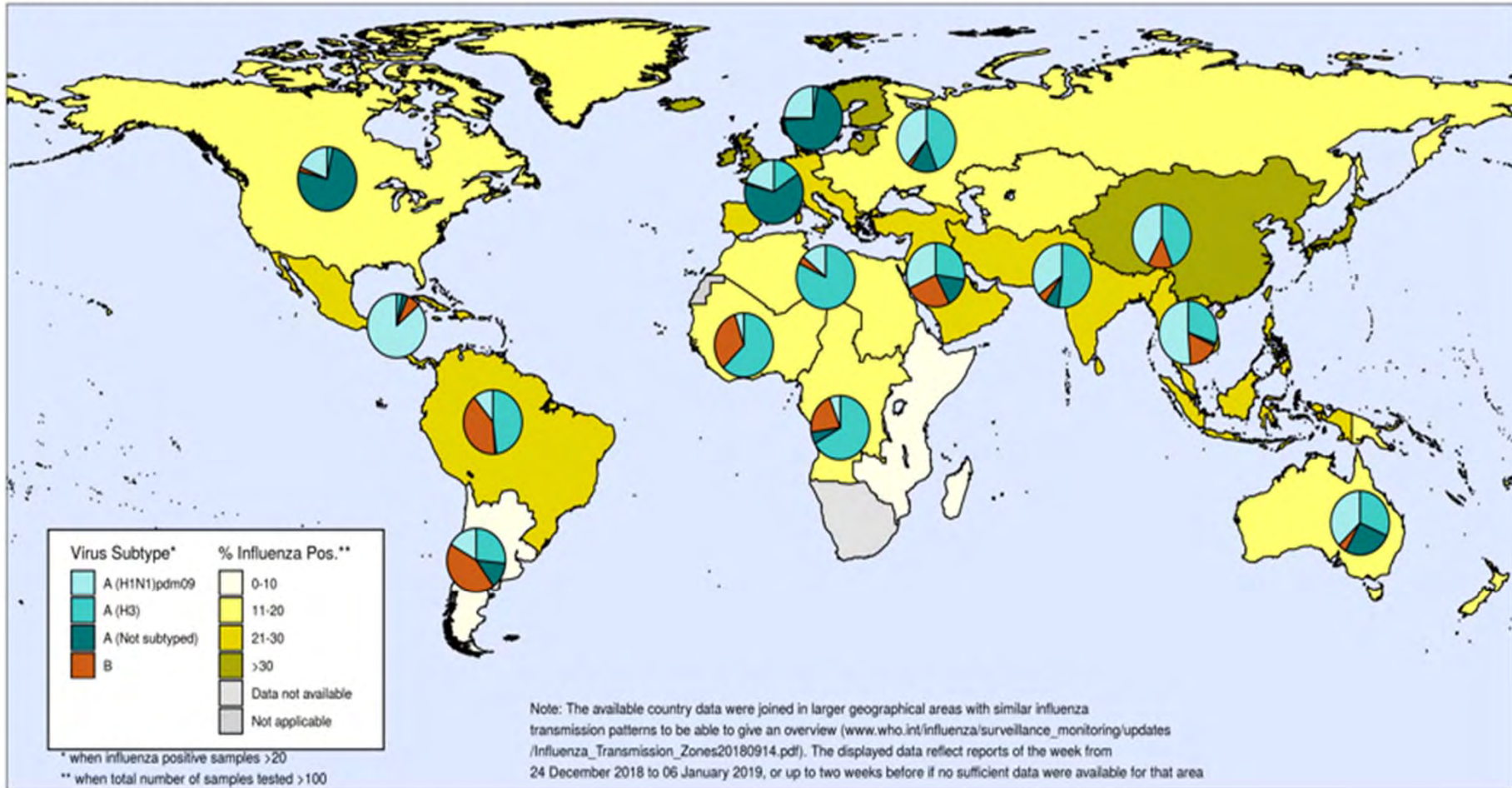
based on the percentage of sentinel specimens found positive, by week



WHO Flunet global influenza map (at 17 Jan 2020)

Percentage of respiratory specimens that tested positive for influenza
By influenza transmission zone

Map generated on 17 January 2020



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.



Data source: Global Influenza Surveillance and Response System (GISRS), FluNet (www.who.int/flu-net)
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Summary of influenza seasons

- 2019 a very high influenza season in Australia
- 2019 an lower activity season in NZ (below seasonal baseline level)
- Influenza A(H3N2) predominated in Aus + NZ
- B-Victoria lineage most common B virus in Australia (10:1 Vic:Yam) & NZ
- Record number of vaccines distributed in Australia – 12.5M doses (50% pop)
- Vaccine match – good for H1N1pdm and B's, A(H3N2) - moderate
- Very few oseltamivir/zanamivir resistant viruses detected; No baloxavir marboxil resistance
- Hospital admissions & deaths in Australia both high
- Vaccine Effectiveness: Australia good; Overall A/B VE=48%; H3 lower VE=39%
- H3N2 + H1N1pdm + B/Vic components of Australian/NZ 2020 vaccine updated from 2019
- Influenza activity 2019-20 in Nth Hemisphere; high in USA and low in EU, low in Japan
- A(H1N1)pdm09 increasing in USA after B-Vic early, ? Second wave, Japan mostly H1pdm, China mix H3/B/Vic, EU mix of H3/H1/B-Vic

- Prediction for 2018; A quiet year with B's and H1N1pdm's predominating!! ✓
- Prediction for 2019: A moderate year with mixed viruses and more H3N2!! ✗



Prediction for 2020: A quiet year with H1pdm viruses predominating!!

Acknowledgments

- Various influenza reports
 - Australian influenza surveillance report
 - NSW Influenza report
 - ESR Influenza weekly update
 - CDC Fluview
 - ECDC Influenza report
 - WHO reports
- NICs and labs that have sent us samples
- Staff at Melbourne WHO CC
- Sheena Sullivan for VE data
- Other WHO CC's
- Surveillance Division of OHP, Commonwealth DoH
- WPRO and WHO HQ Geneva



SURVEILLANCE

Intense interseasonal influenza outbreaks, Australia, 2018/19

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