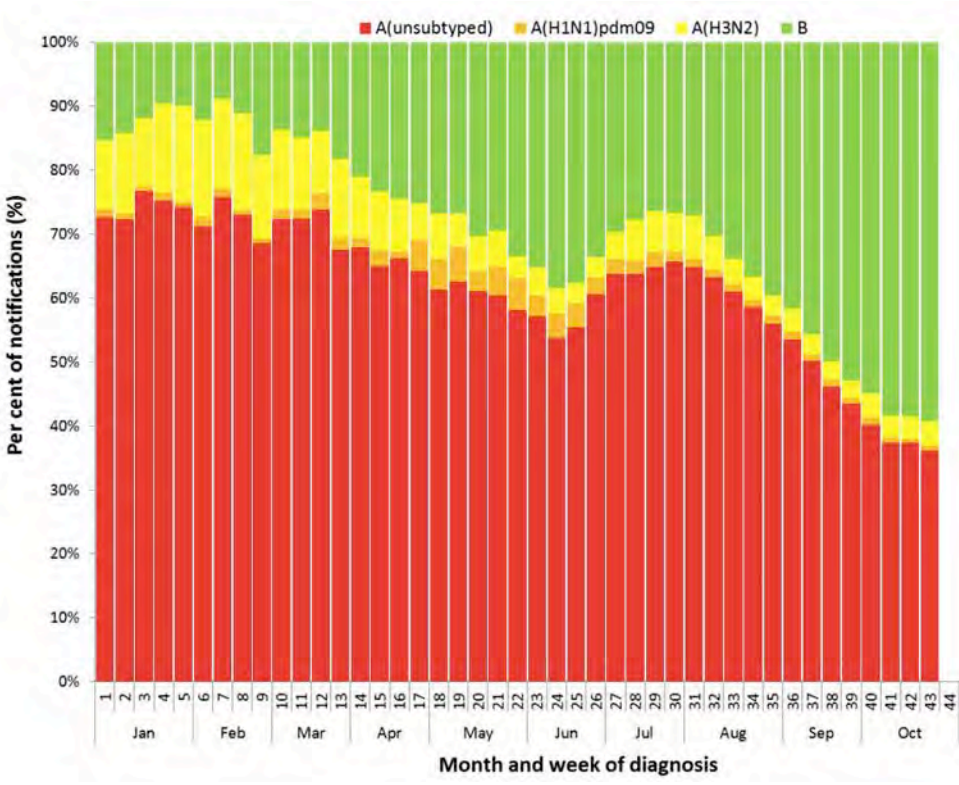
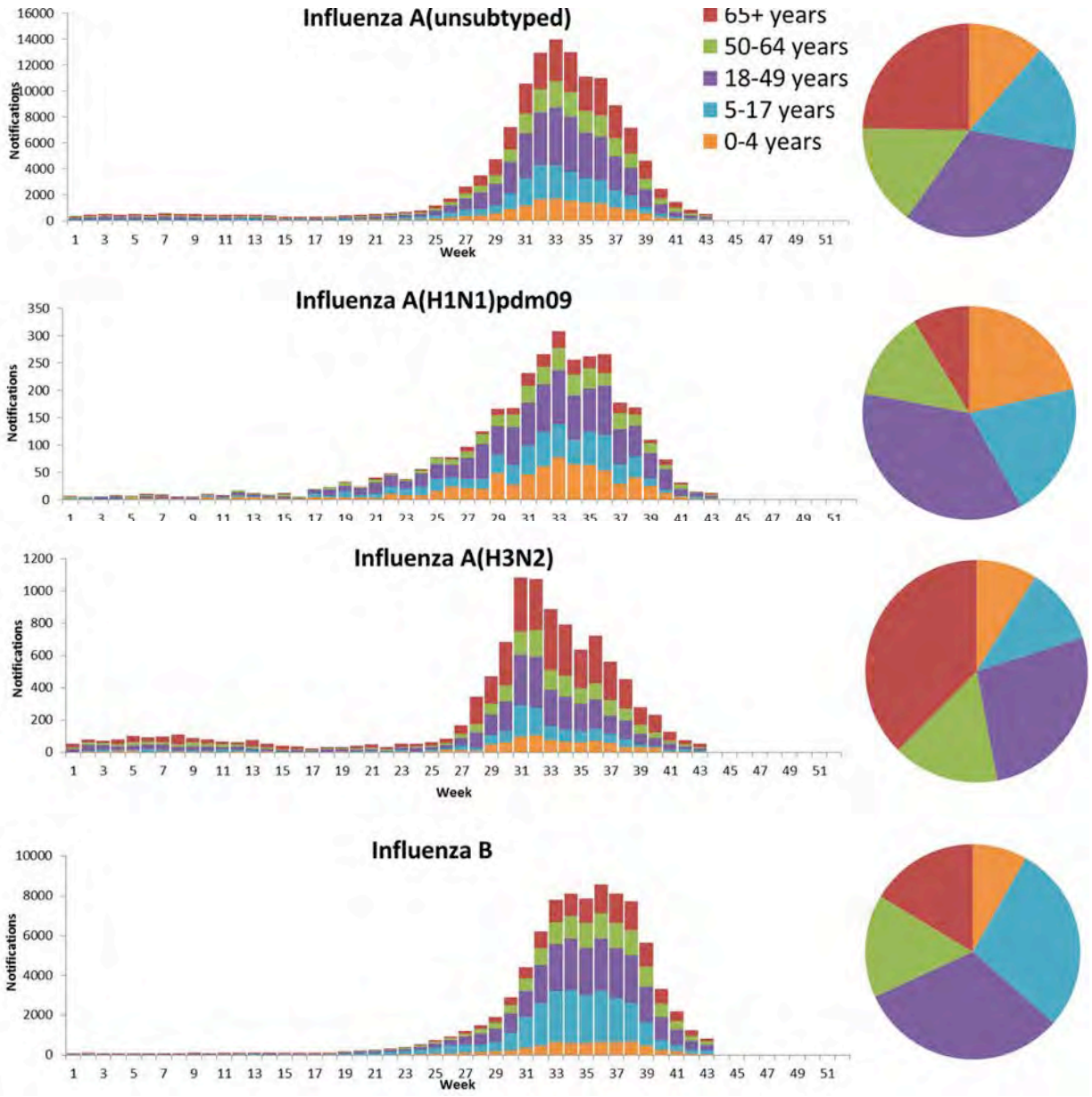
NNDSS – Influenza subtyping for 2017

Type	2014 %	2015 %	2016 %	2017 %	2017 WHO CC
A(H1N1)pdm	11	2	6	**1**	**14**
A(H3N2)	8	7	11	**4**	**63**
A (untyped)	70	29	73	**57**	**-**
B	11	61	10	**37**	**23**



NNDSS Laboratory confirmed influenza cases by age 2016



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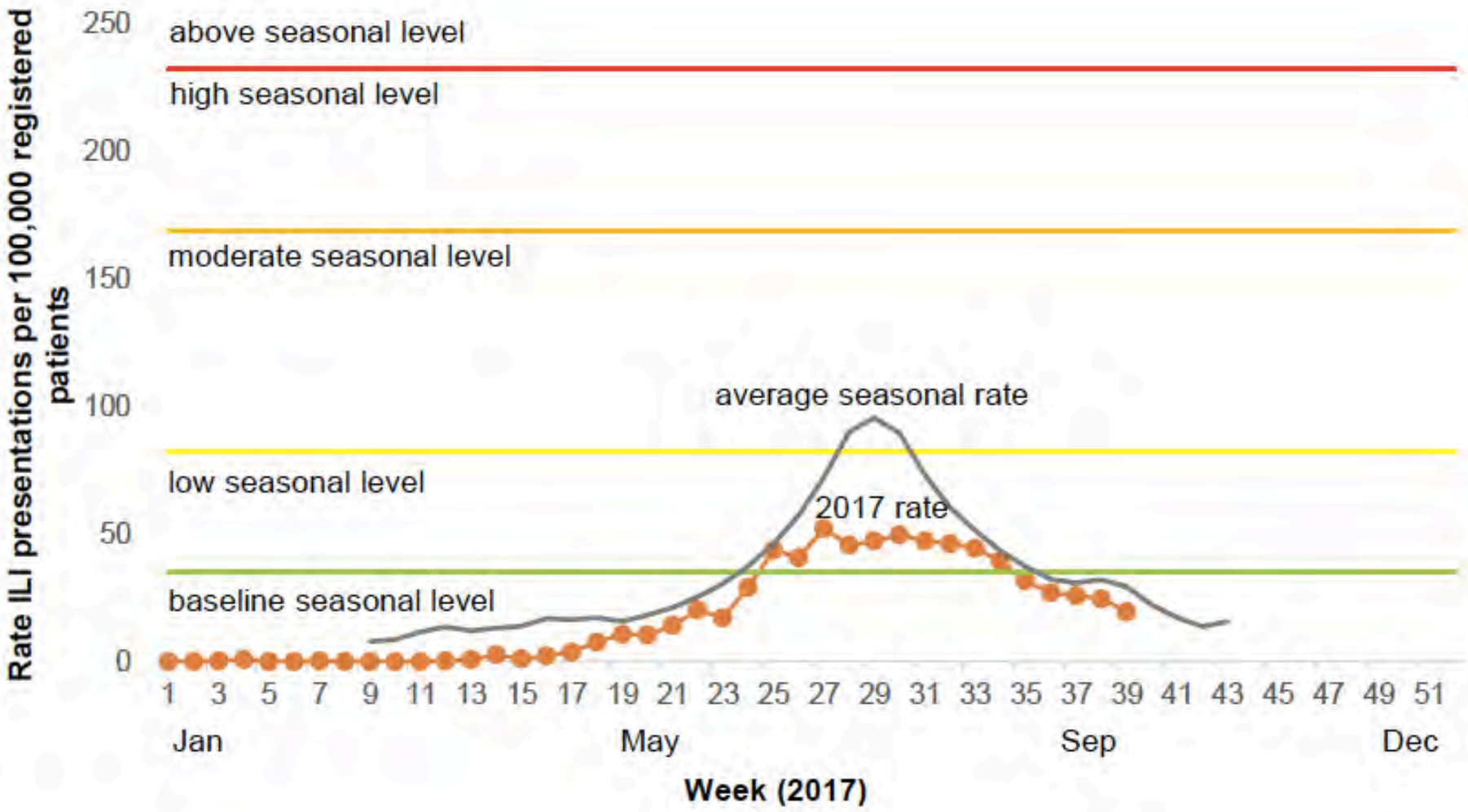
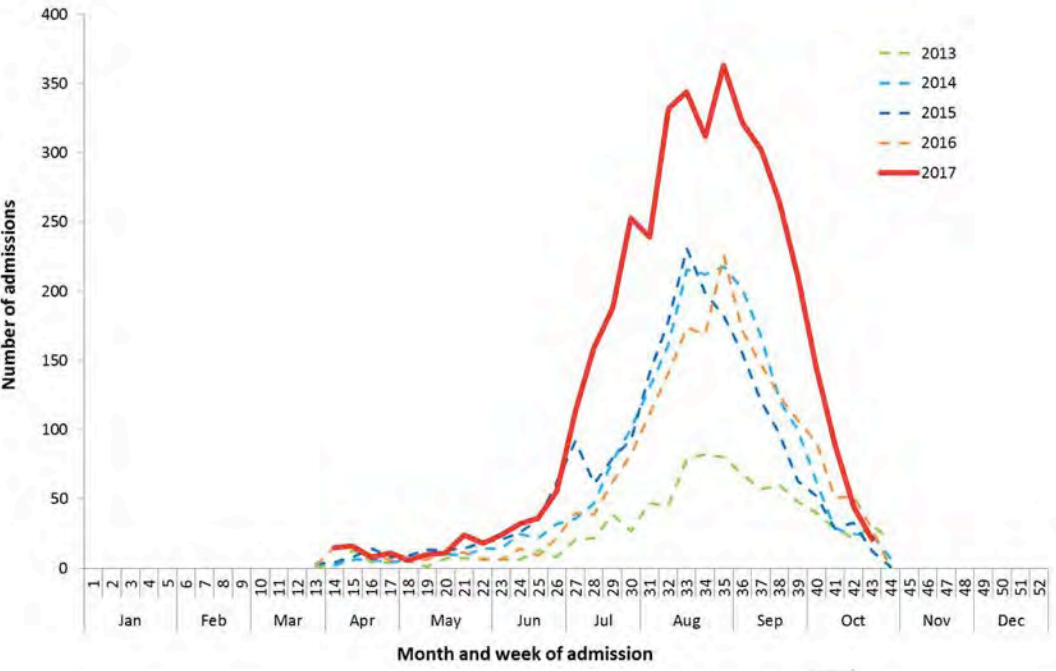
ILI in NZ in 2017



E/S/R

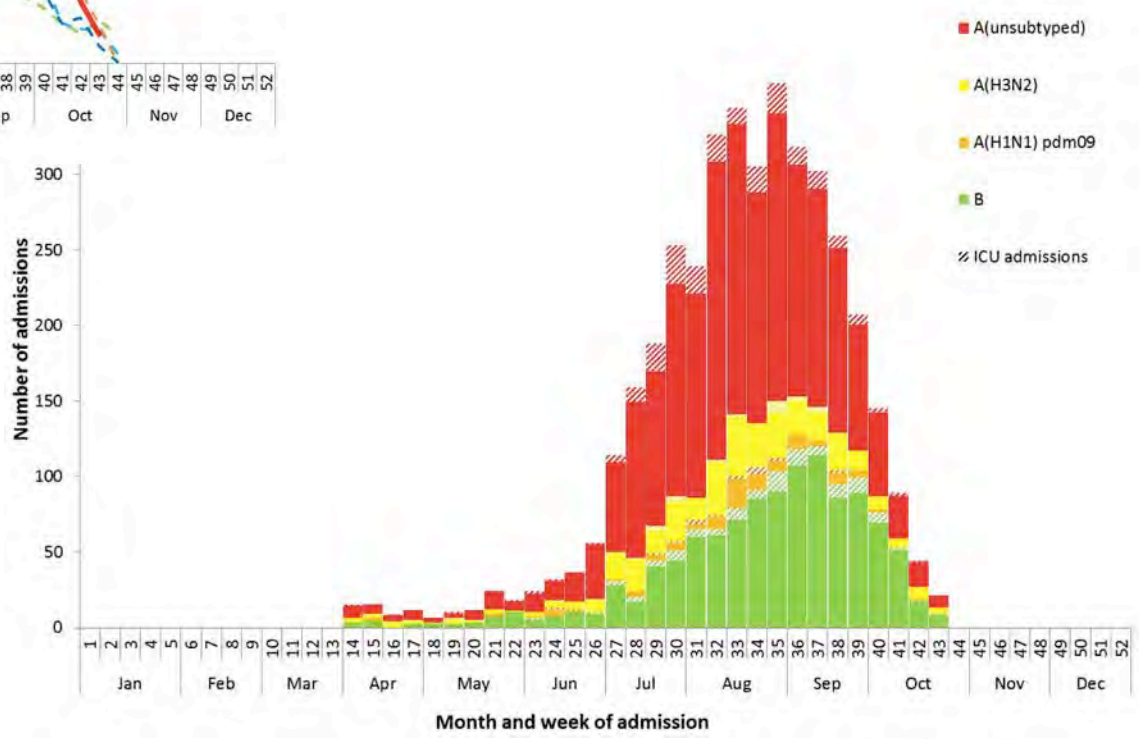
MINISTRY OF HEALTH
MANATŪ HAUORA

FluCAN hospitalisation data



Age y	# hosp	%	Direct to ICU
0-15	572	14	?
16-64	1314	33	11.9
65+	2071	52	8.3

Patients admitted directly to ICU -
- A(H1N1)pdm09 15.8%
- A(H3N2) 8.6%
- influenza B 8.5%.



Australian Government
Department of Health

AUSTRALIAN INFLUENZA SURVEILLANCE REPORT

No. 12, 2017
14 – 27 October 2017

Reported influenza outbreaks in NSW institutions
(up to Nov 2107)

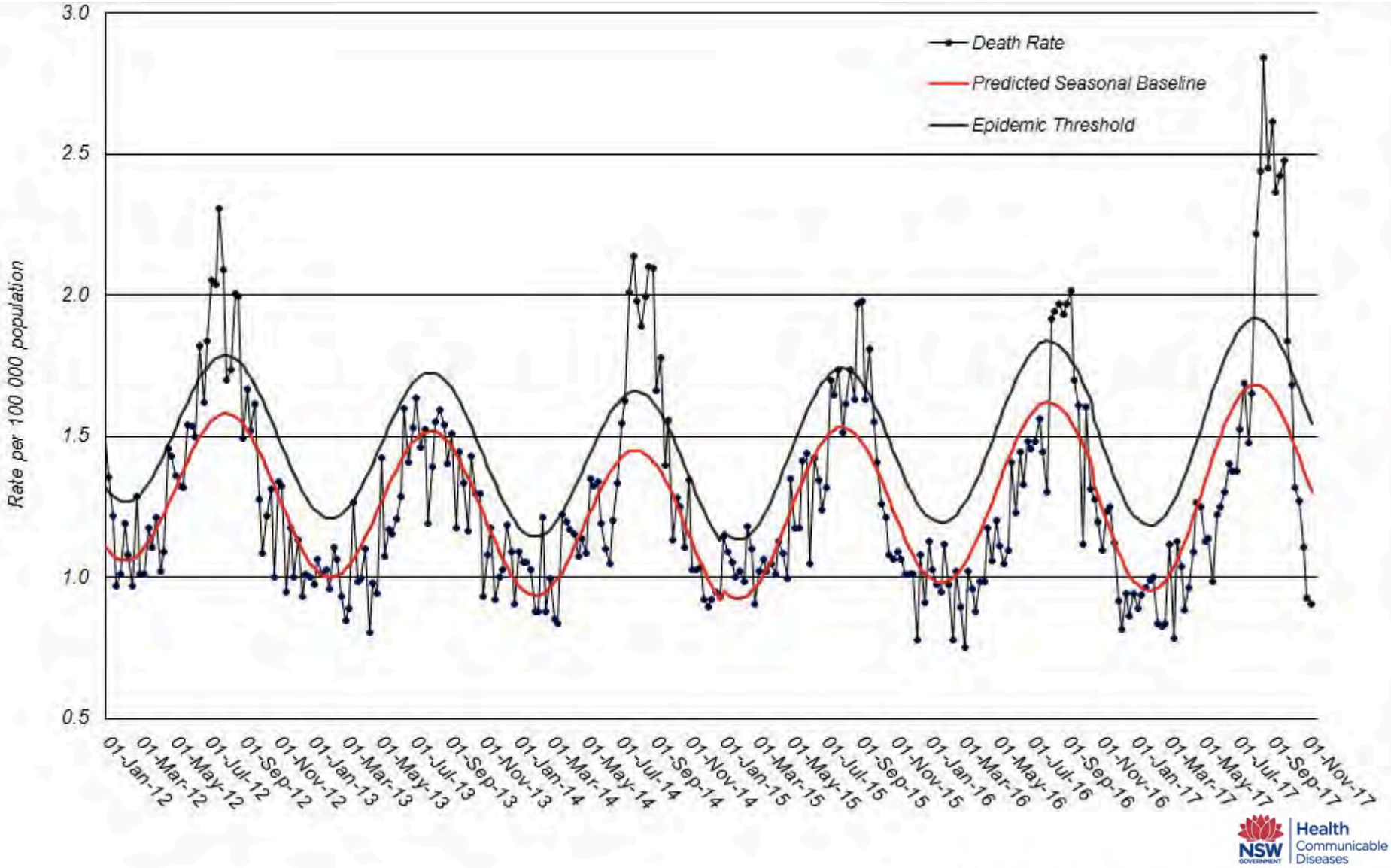
Year	2010	2011	2012	2013	2014	2015	2016	2017*
No. of outbreaks	2	4	39	12	120	103	279	588

Nationally Notified Influenza Associated Deaths

(Aust. Influenza Report)

Year	Deaths #	Median age y	Virus type/subtype
2011	14	47	83% A(H1N1)pdm
2012	60	78	88% A(H3N2)
2013	28	63	86% Influenza A
2014	72	72	100% Influenza A
2015	97	85	B and A(H3N2)
2016	92	80	87% Influenza A
2017	**598**	**85**	**78% influenza A**

Rate of deaths classified as influenza and pneumonia per 100 000 NSW population, 2012 – 2017



Source: NSW Registry of Births, Deaths and Marriages

Vaccine effectiveness for Australia 2017 - Overall

RAPID COMMUNICATIONS **Eurosurveillance October 26 2017**

Low interim influenza vaccine effectiveness, Australia, 1 May to 24 September 2017

Sheena G Sullivan[1,2,3], Monique B Chilver[3], Kylie S Carville[4], Yi-Mo Deng[1], Kristina A Grant[4], Geoff Higgins[5], Naomi Komadina[1], Vivian KY Leung[1], Cara A Minney-Smith[6], Don Teng[7], Thomas Tran[4], Nigel Stocks[3], James E Fielding[2,4]

Type/subtype	Age group	Cases				Controls				Adjusted[a] VE (95% CI)
		Unvaccinated		Vaccinated		Unvaccinated		Vaccinated		
A or B	All ages	772	73%	288	27%	802	63%	477	37%	33% (17 to 46)
	Children<15y	235	94%	14	6%	179	94%	12	6%	16% (-95 to 63)
	Adults 15–64y	512	74%	181	26%	587	65%	322	35%	39% (24 to 51)
	Adults ≥65y	25	21%	93	79%	36	20%	143	80%	-3% (-92 to 44)

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Vaccine effectiveness for Australia 2017 - By type/subtype/lineage

Type/subtype	Age group	Cases				Controls				Adjusted[a] VE (95% CI)
		Unvaccinated		Vaccinated		Unvaccinated		Vaccinated		
A(H1)pdm09	All ages	74	84%	14	16%	802	63%	477	37%	50% (8 to 74)
	Children<15y	33	97%	1	3%	179	94%	12	6%	NE
	Adults 15–64y	40	78%	11	22%	587	65%	322	35%	49% (2 to 76)
	Adults≥65y	1	33%	2	67%	36	20%	143	80%	NE
A(H3)	All ages	347	66%	175	34%	802	63%	477	37%	10% (-16 to 31)
	Children<15y	100	94%	6	6%	179	94%	12	6%	17% (-132 to73)
	Adults 15–64y	233	68%	110	32%	587	65%	322	35%	16% (-11 to 36)
	Adults≥65y	14	19%	59	81%	36	20%	143	80%	-20% (-160 to 42)
B	All ages	306	82%	69	18%	802	63%	477	37%	57% (41 to 69)
	Children<15y	91	96%	4	4%	179	94%	12	6%	NE
	Adults 15–64y	208	82%	45	18%	587	65%	322	35%	63% (48 to 74)
	Adults≥65y	7	26%	20	74%	36	20%	143	80%	10% (-156 to 65)
B/Victoria	All ages	11	100%	0	0%	802	63%	477	37%	NE
	Children<15y	4	100%	0	0%	179	94%	12	6%	NE
	Adults 15–64y	7	100%	0	0%	587	65%	322	35%	NE
	Adults≥65y	0	NA	0	NA	36	20%	143	80%	NE
B/Yamagata	All ages	206	80%	53	20%	802	63%	477	37%	45% (22 to 62)
	Children<15y	71	96%	3	4%	179	94%	12	6%	NE
	Adults 15–64y	130	77%	38	23%	587	65%	322	35%	49% (26 to 66)
	Adults≥65y	5	29%	12	71%	36	20%	143	80%	27% (-162 to 77)

Influenza vaccines for Australia and NZ in 2018

- H1N1pdm – A/Michigan/45/2014-like

- H3 – A/Singapore/INFIMH-16-0019/2016-like

Trivalent vaccine:

- B – B/Phuket/3073/2013-like (B/Yam)

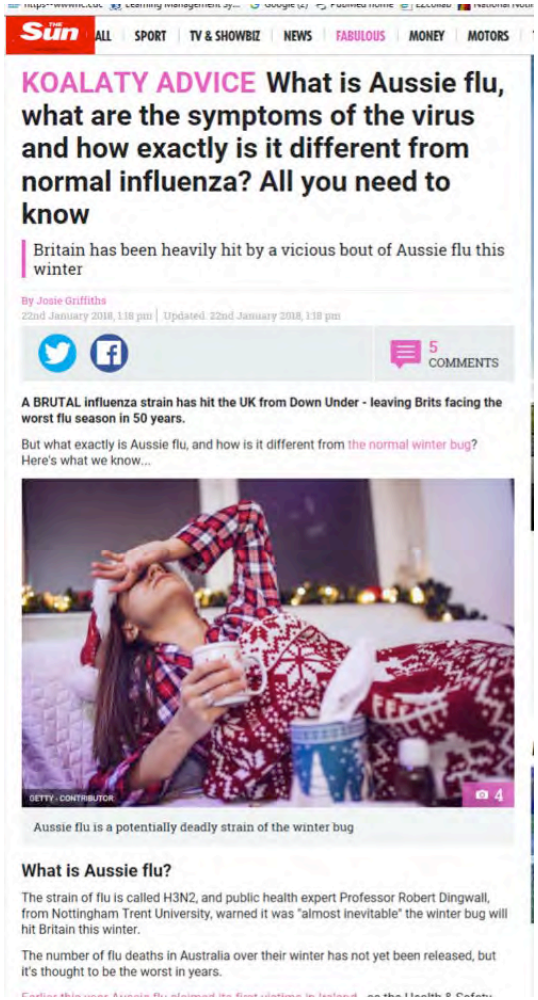
Quadrivalent vaccine:

- B – B/Phuket/3073/2013-like (B/Yam)
- B – B/Brisbane/60/2008-like (B/Vic)

*Changes to 2017 recommendations

The NH 2017-8 influenza season
(so far)

“Aussie Flu” hits UK as at 22 Jan 2018



The Sun — ALL | SPORT | TV & SHOWBIZ | NEWS | FABULOUS | MONEY | MOTORS

KOALATY ADVICE What is Aussie flu, what are the symptoms of the virus and how exactly is it different from normal influenza? All you need to know

Britain has been heavily hit by a vicious bout of Aussie flu this winter

By Josie Griffiths
22nd January 2018, 1:18 pm | Updated: 22nd January 2018, 1:18 pm

5 COMMENTS

A BRUTAL influenza strain has hit the UK from Down Under - leaving Brits facing the worst flu season in 50 years.

But what exactly is Aussie flu, and how is it different from the normal winter bug? Here's what we know...

Aussie flu is a potentially deadly strain of the winter bug

What is Aussie flu?

The strain of flu is called H3N2, and public health expert Professor Robert Dingwall, from Nottingham Trent University, warned it was "almost inevitable" the winter bug will hit Britain this winter.

The number of flu deaths in Australia over their winter has not yet been released, but it's thought to be the worst in years.

The Sun — ALL | SPORT | TV & SHOWBIZ | NEWS | FABULOUS | MONEY | MOTORS

Which areas of the UK have been worst hit by Aussie flu?

A surge in infections has seen cases of the new H3N2 strain skyrocket in recent weeks as the NHS faces a seriously challenging flu season.

Plymouth, Doncaster and Durham are revealed as Aussie flu hotspots while other parts of the country have no recorded outbreaks, according to a map compiled by the FluSurvey website.

Dartford is one of the last areas to have cases reported, with Essex, Teesside and Devon appearing to be among the worst-hit regions.

Dorchester in Dorset and the City of London as of January 6 were the only places where no one has yet reported an "influenza-like illness" - with churches even banning handshakes in an attempt to curb the spread of infection.

It relies on patients self-reporting so the true figure in each region is likely to be far higher.

The flu virus has continued to spread across the UK, including a rise in cases of the H3N2 'Aussie' strain, correct as of Friday January 5 and Sunday January 7

How many people have been affected by Aussie flu?

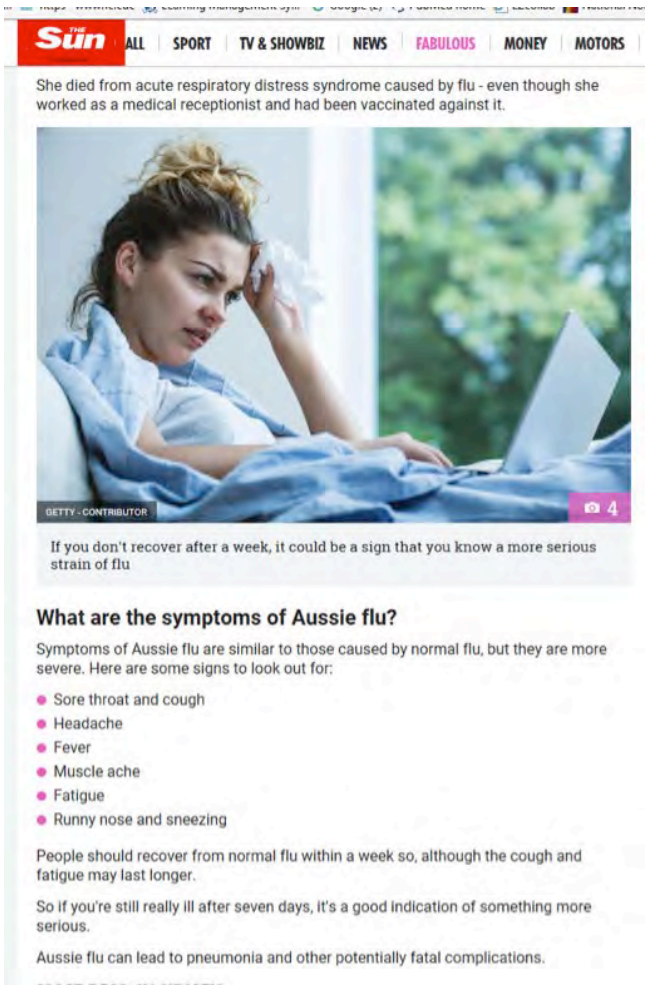
Public Health England revealed 1,649 people had been struck down with Aussie flu over the Christmas week, up almost half on the week before.

And at least 73 have already been admitted to hospital, causing doctors to urge people to get vaccinated - as the flue "actively circulates" in Ireland.

Professor Dingall previously told the Daily Express that this is the most serious flu epidemic since the 1968 pandemic that started in Hong Kong - and killed a million people worldwide.

H3N2 is a mutated strain of flu, meaning the vaccine in Australia has been less effective than hoped.

Mum-of-two Jennifer Thew, who's originally from Germany, was one of those to die from flu in Australia in September.



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She died from acute respiratory distress syndrome caused by flu - even though she worked as a medical receptionist and had been vaccinated against it.

If you don't recover after a week, it could be a sign that you know a more serious strain of flu

What are the symptoms of Aussie flu?

Symptoms of Aussie flu are similar to those caused by normal flu, but they are more severe. Here are some signs to look out for:

- Sore throat and cough
- Headache
- Fever
- Muscle ache
- Fatigue
- Runny nose and sneezing

People should recover from normal flu within a week so, although the cough and fatigue may last longer.

So if you're still really ill after seven days, it's a good indication of something more serious.

Aussie flu can lead to pneumonia and other potentially fatal complications.

https://flusurvey.org.uk/

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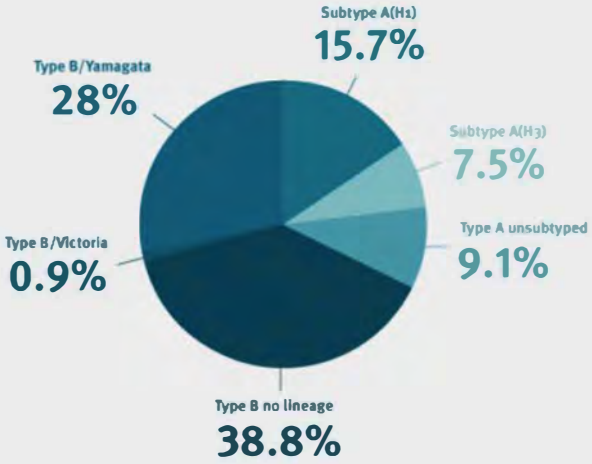
Influenza in Europe

Data from EU and EEA countries for the 2017–18 season

Week 4 (22–28 January 2018)

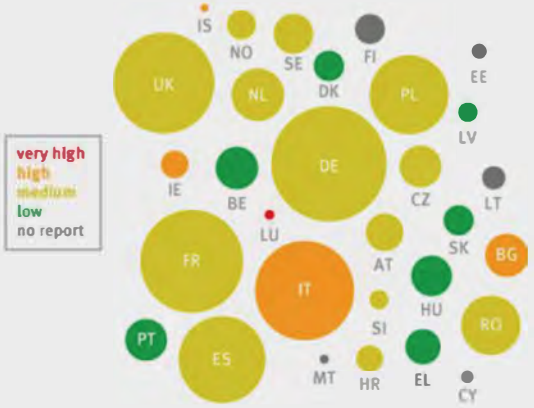
Influenza viruses circulating in 2017–2018

Only sentinel specimens are included



Influenza intensity in week 4

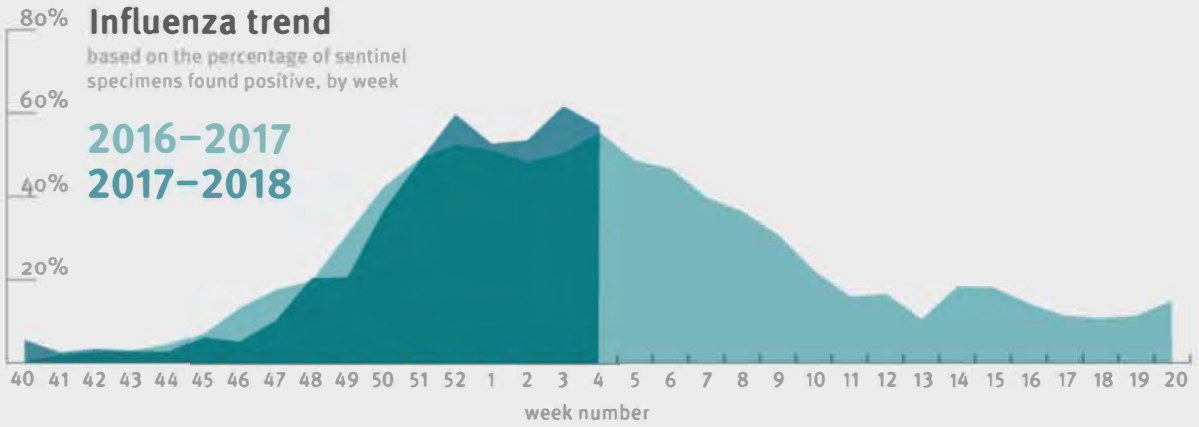
based on sentinel reports of influenza-like illness and/or acute respiratory infections



Bubble size is indicative of country population

Influenza trend

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



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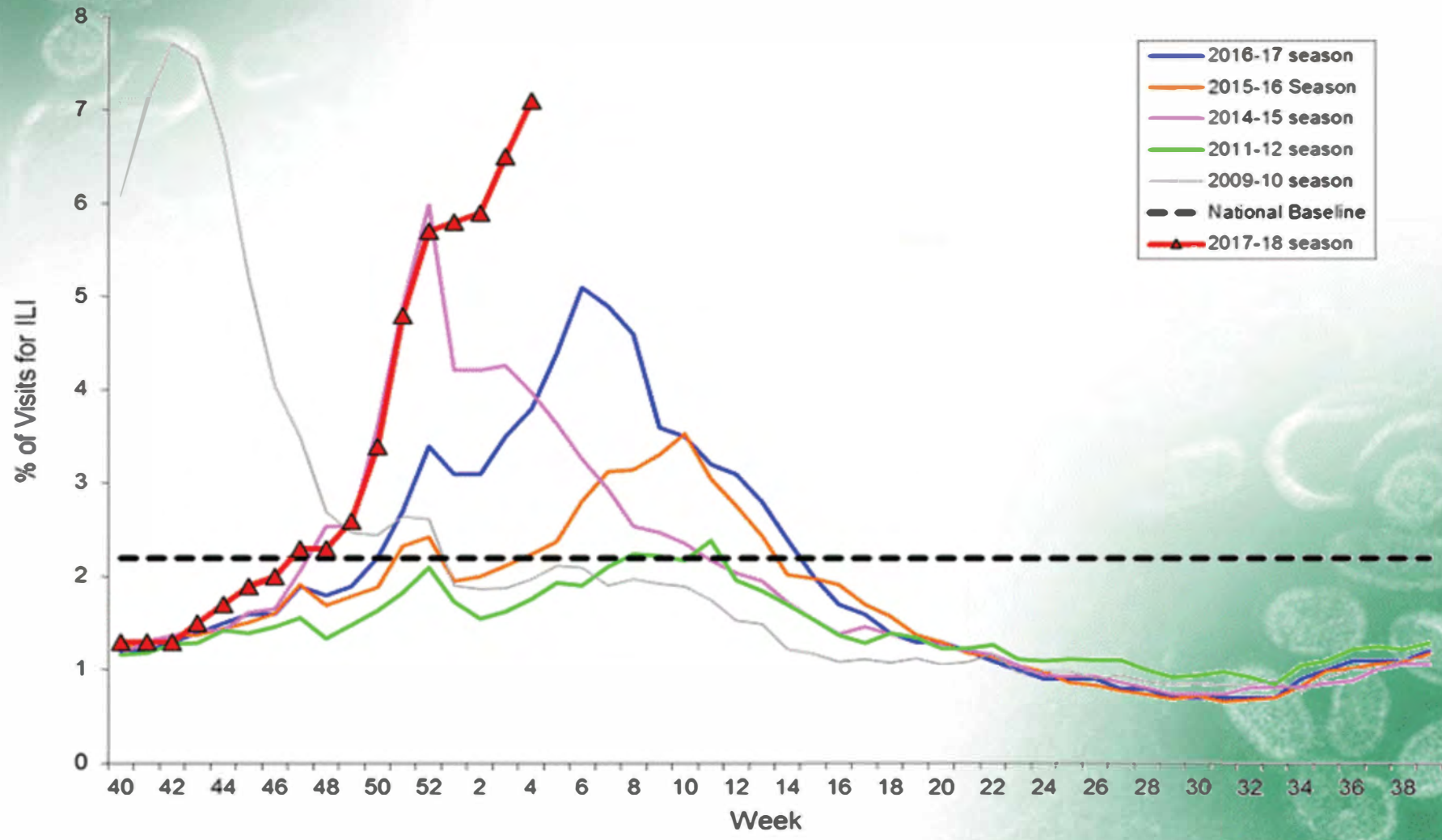
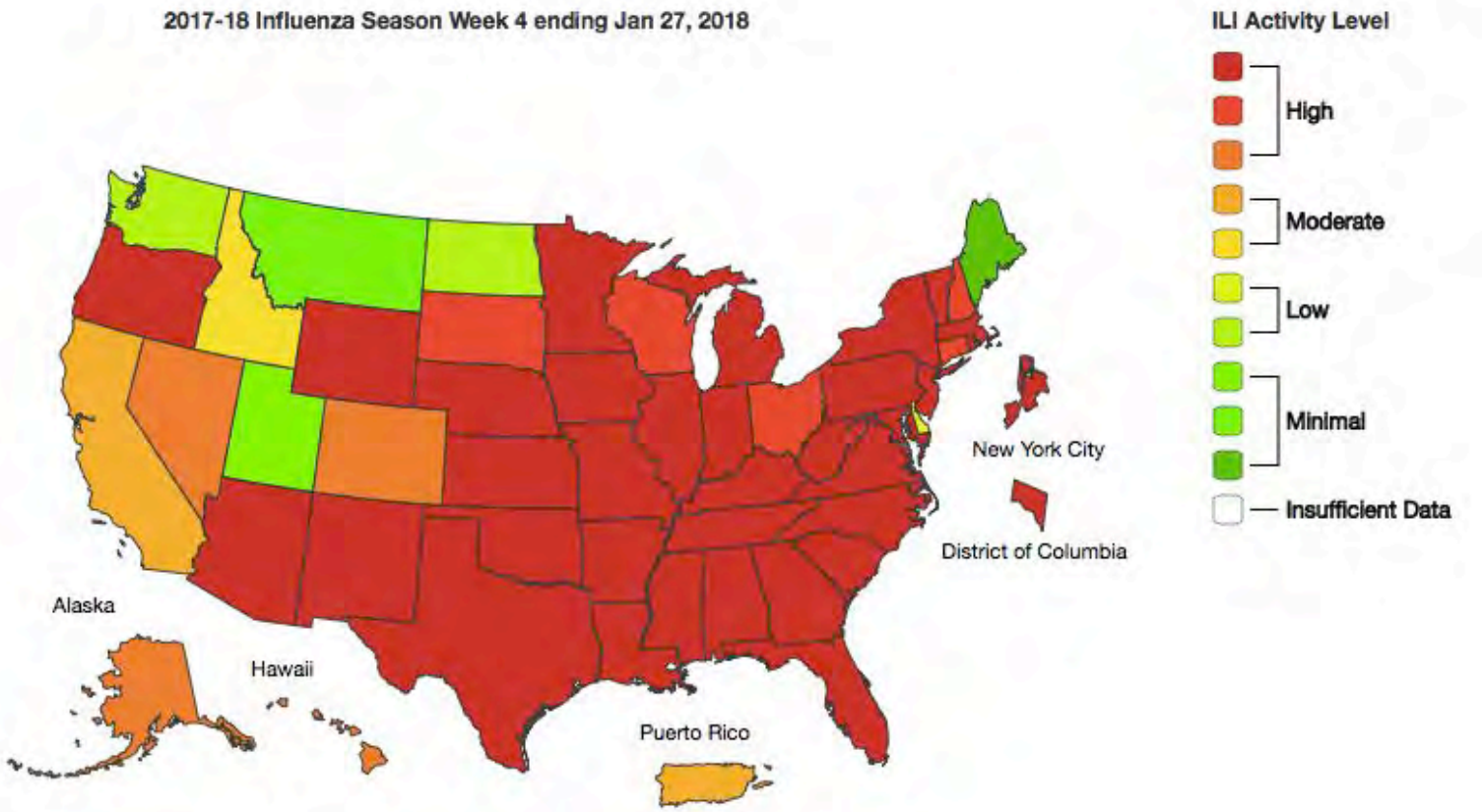
FLUVIEW

A Weekly Influenza Surveillance Report Prepared by the Influenza Division

Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2017-2018 and Selected Previous Seasons



Fluview: Influenza in the USA as at Feb 1 2018



FLUVIEW
A Weekly Influenza Surveillance Report Prepared by the Influenza Division

FLUVIEW

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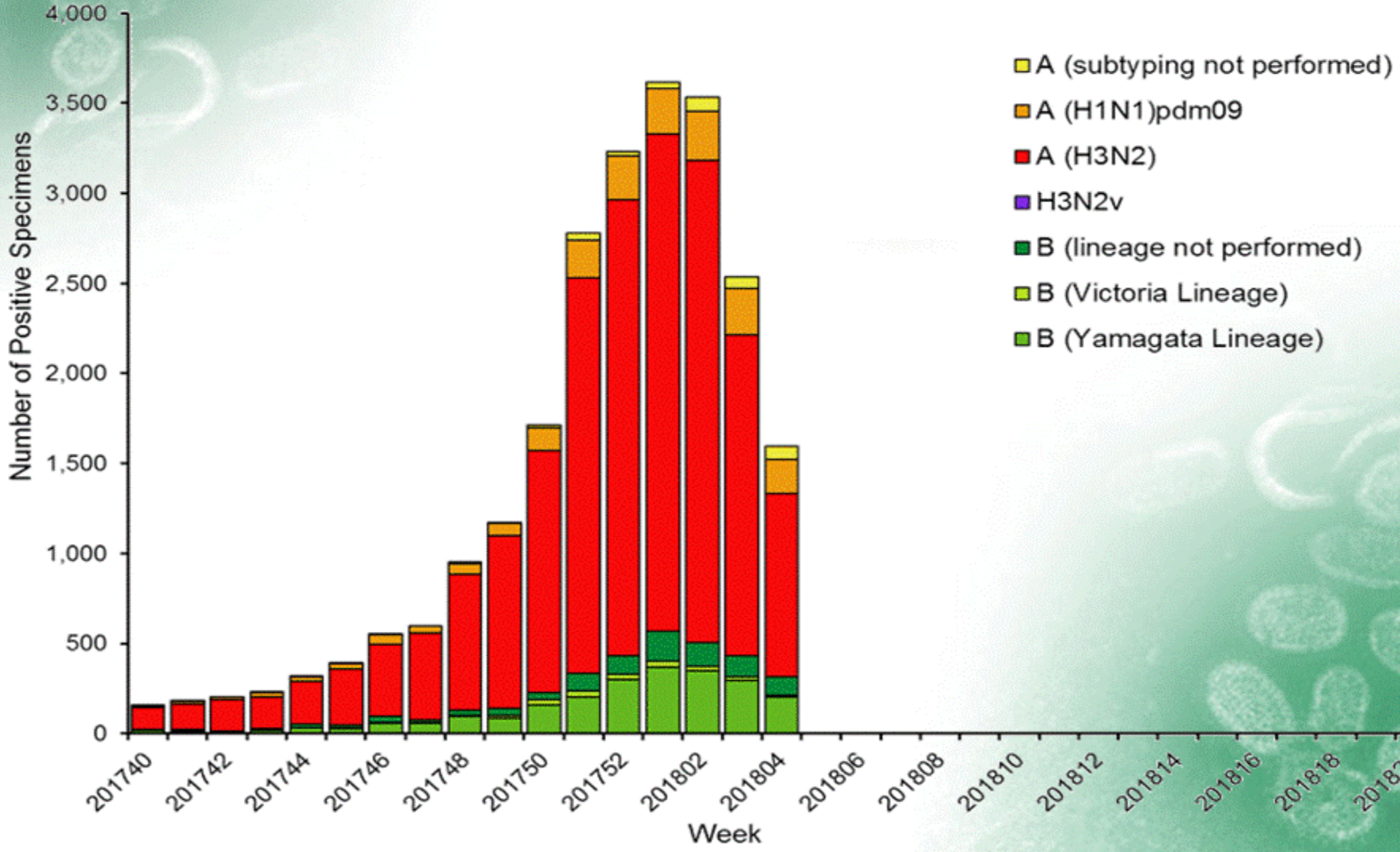
CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, National Summary, 2017-2018 Season

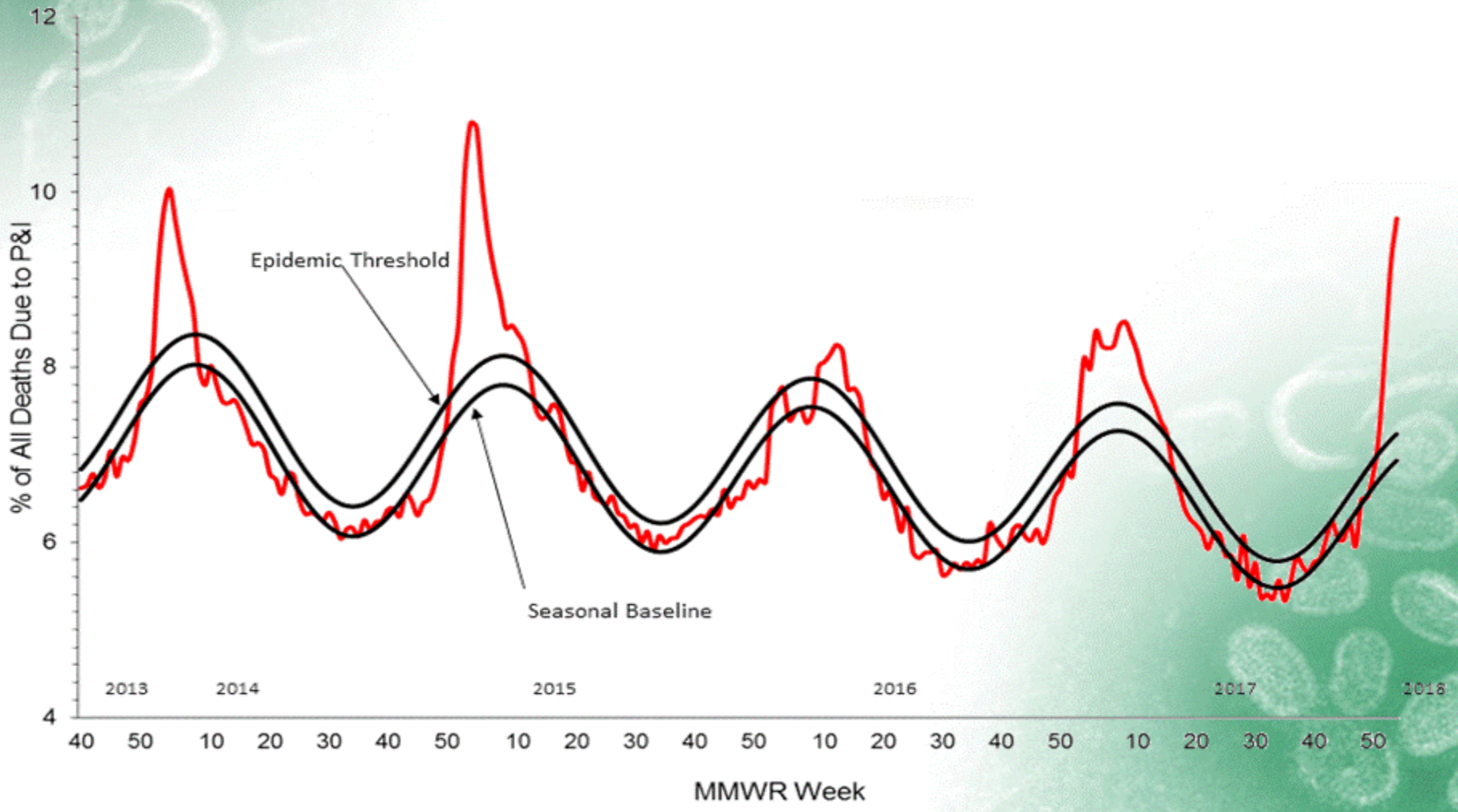


FLUVIEW

A Weekly Influenza Surveillance Report Prepared by the Influenza Division

Pneumonia and Influenza Mortality from the National Center for Health Statistics Mortality Surveillance System

Data through the week ending January 13, 2018, as of February 1, 2018



FLUVIEW

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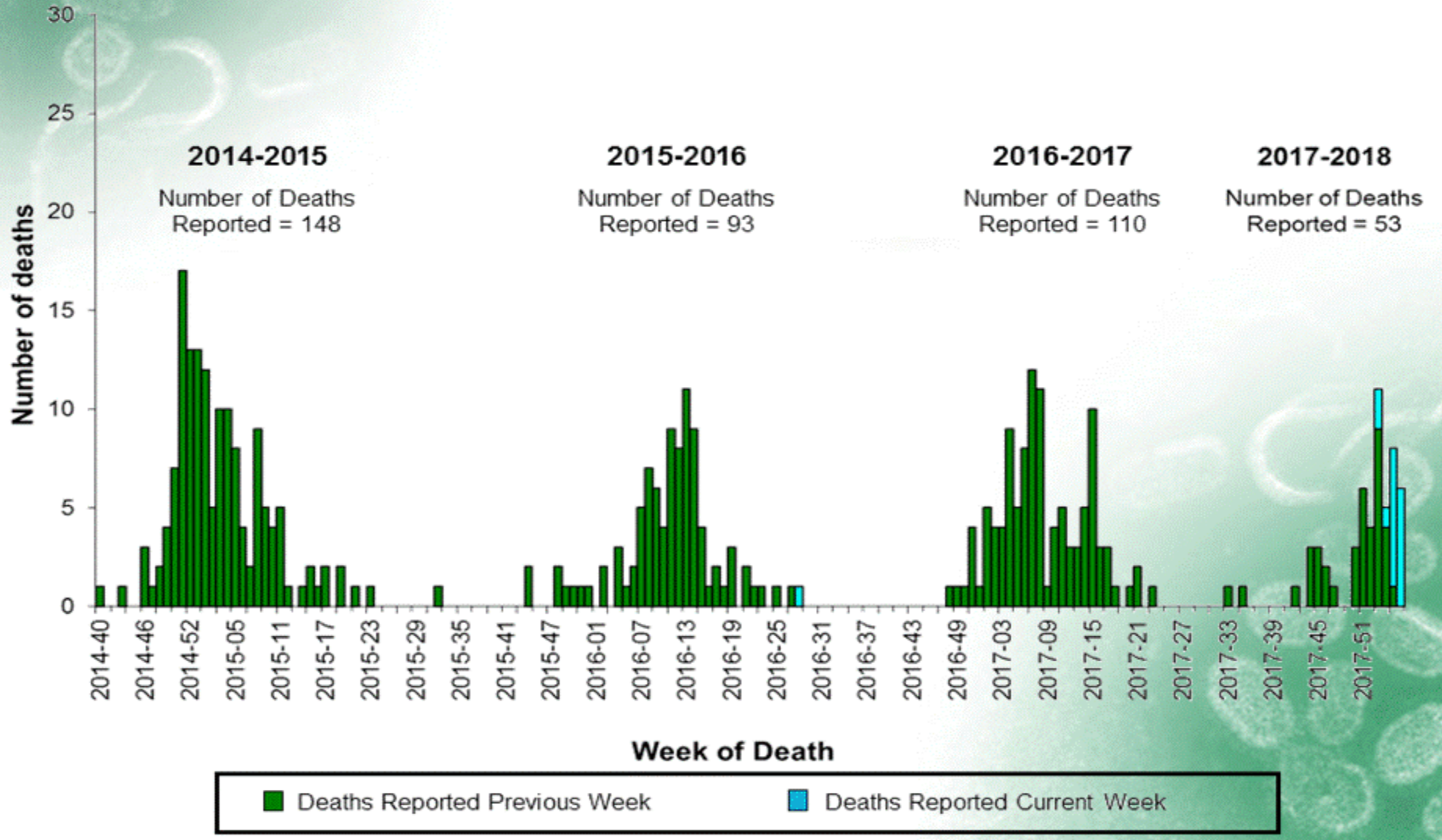
Number of Influenza-Associated Pediatric Deaths by Week of Death: 2014-2015 season to present



FLUVIEW

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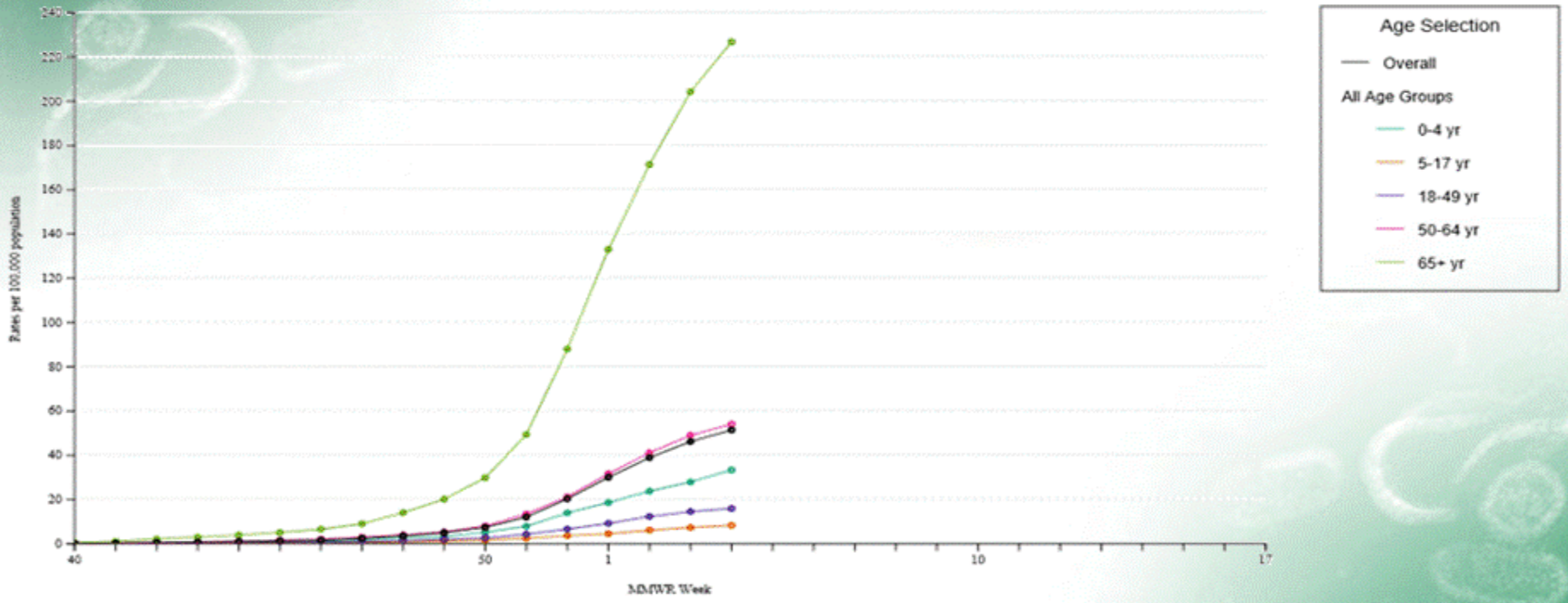
Laboratory-Confirmed Influenza Hospitalizations

Preliminary cumulative rates as of Jan 27, 2018



Summary of influenza seasons

- Mega season in Australia (highest on record by NNDSS) with exception of WA!
- Low season in NZ; LC ILI activity just above season baseline (40 cases/100,000 population)
- Influenza H3 predominant in Aus + NZ
- B-Yamagata lineage predominated in Australia (10:1 Yam:Vic) & NZ
- Vaccine match – good for H1N1pdm and B's, A(H3N2) - poor
- Very few oseltamivir resistant viruses detected
- Hospital admissions & deaths in Australia both high
- Australian Vaccine Effectiveness: INTERIM data 33% overall but only 10% for H3N2
- H3N2 component of the Australian/NZ 2018 vaccine updated from 2017
- Influenza activity 2017-8 in Nth Hemisphere; high in USA, moderate in EU
- A(H3N2) the predominant virus in USA, B's in Europe/China, H1N1pdm in Japan

- Why was 2017 such a big year? $64M question; Low population immunity (H3 2012/4/6). Poor vaccine performance of H3 (egg adaptions), Number of H3 variants co-circulating????

- Prediction for 2018; A quiet year with B's and H1N1pdm's predominating!!

Acknowledgments

- Various influenza reports
  - Australian influenza surveillance report
  - NSW Influenza report
  - ESR Influenza weekly update
  - CDC Fluview
  - ECDC
  - WHO reports
- NICs and labs that have sent us samples
- Staff at Melbourne WHO CC
- Sheena Sullivan for VE data
- Other WHO CC's especially CNIC for zoonotic reports
- WPRO and WHO HQ Geneva

Possible ways to improve Australia's response to influenza epidemics

(especially A(H3N2)-driven ones) ROUND TABLE DISCUSSION

1. **Vaccine improvements – targeting of susceptible/at risk groups**
   a. High dose or adjuvanted vaccines especially for the elderly (or focus on nursing home residents)
   b. LAIV for school aged children (similar to the current UK system), or free IIV like WA & QLD
   c. Non-egg based vaccines; Protein sciences rHA, cell-based vaccines, recombinant proteins, VLP's etc
   d. Mandatory vaccination for HCW and nursing home staff, carers etc
   e. Wider use of pneumococcal vaccines in adults not just elderly
   f. Free vaccine for everyone!!
2. **Antiviral drug use/availability**
   a. Neuraminidase inhibitors available OTC as is the case in NZ during the flu season
   b. Better use of Government stockpiles when NI's are in short supply eg 2017
   c. Mandatory stocking of nursing homes with NI and training of staff in how/when to use them
3. **Public Health measures**
   a. Appoint Robert Booy as minister for influenza prevention
   b. Run TV advertisements/social media campaigns on getting vaccinated, issues/advantages, pregnancy etc.
   c. Improving flu' etiquette amongst the public by public awareness campaigns; eg. staying home if infected, not coughing or sneezing on others, not shaking hands and regular hand washing by everyone
   d. Use of masks, cancelling major events, closing schools or day-care centres during peak activity
   e. Change the vaccine recommendations to everyone above 6 months of age (like the USA)
   f. Increased rapid diagnostic testing for influenza; place in all nursing homes, home testing, other sites?
4. **Research**
   a. More research/funding on Universal influenza vaccine development
   b. Federal Gov. to fund cost/benefit studies on use of "new" vaccines in elderly/institutionalized
   c. Have an NHMRC special fund for ideas that address the issue eg like 2009 H1pdm09 research funding
5. **Other**
   a. ???
   b. ???
   c. ???