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# Community and Hospital Surveillance

## ILI, SARI ICU, Influenza and Respiratory Pathogens

2017 Influenza Season, December 2017

### SUMMARY

During December, influenza activity was low among consultation-seeking patients nationwide. Influenza activity was also low among those hospitalised ICU patients in Auckland and Counties Manukau District Health Boards.

- **Influenza-like illness (ILI) and severe acute respiratory illness (SARI) surveillance**

**ILI surveillance:** One patient with influenza-like illness consulted sentinel general practices in 20 DHBs. The monthly ILI incidence was 0.2 per 100 000 patient population (Figure 1).

**ICU surveillance:** During December, there were 7 cases admitted to ICU. Since the 2 January 2017, there have been a total of 335 ICU cases.

**ILI counts and rates by DHB by week are available in the Appendix.**

The surveillance for community-based influenza-like illness (ILI) and hospital-based severe acute respiratory illness (SARI) provides evidence to inform public health and clinical practice to reduce the impact of influenza virus infection and other important respiratory pathogens. This monthly report summarises data obtained from the ILI and SARI surveillance platforms. The report includes incidence and demographic characteristics for community ILI cases as well as hospital SARI ICU admissions for the past month as well as the cumulative period since 2 January 2017.

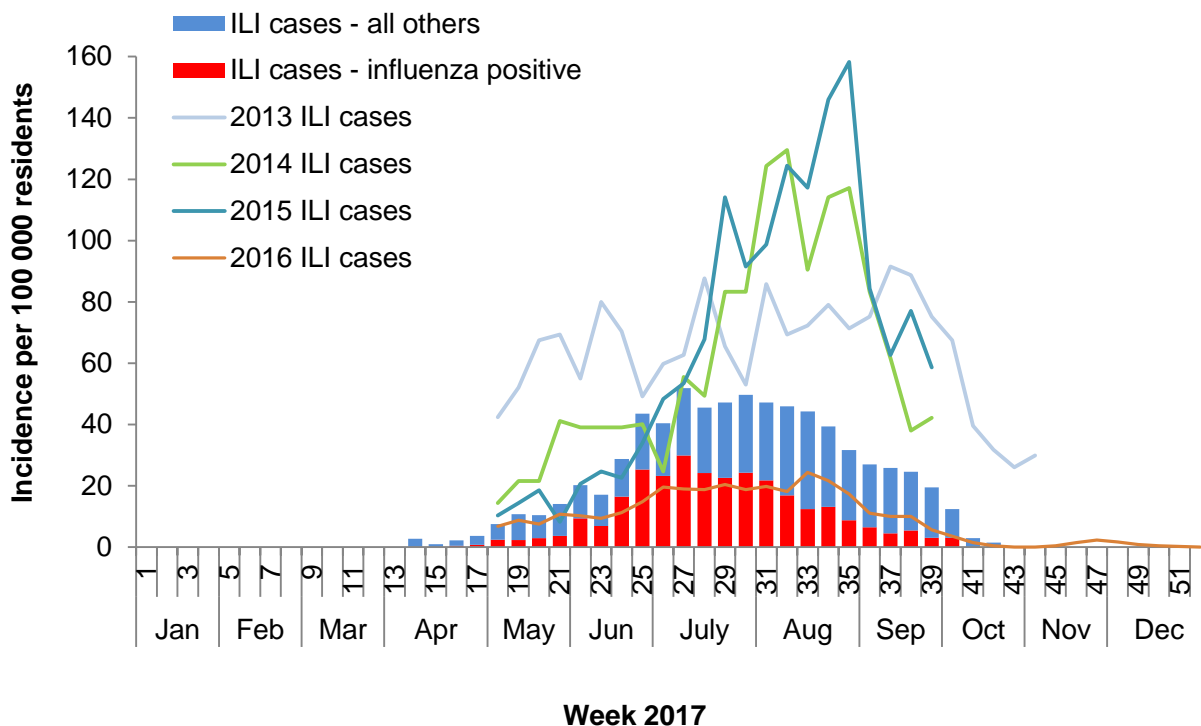
Note: Data in this report are provisional and may change as more cases are assessed and information is updated. Data were extracted on 17 January 2018.

## INFLUENZA-LIKE ILLNESS and SEVERE ACUTE RESPIRATORY ILLNESS

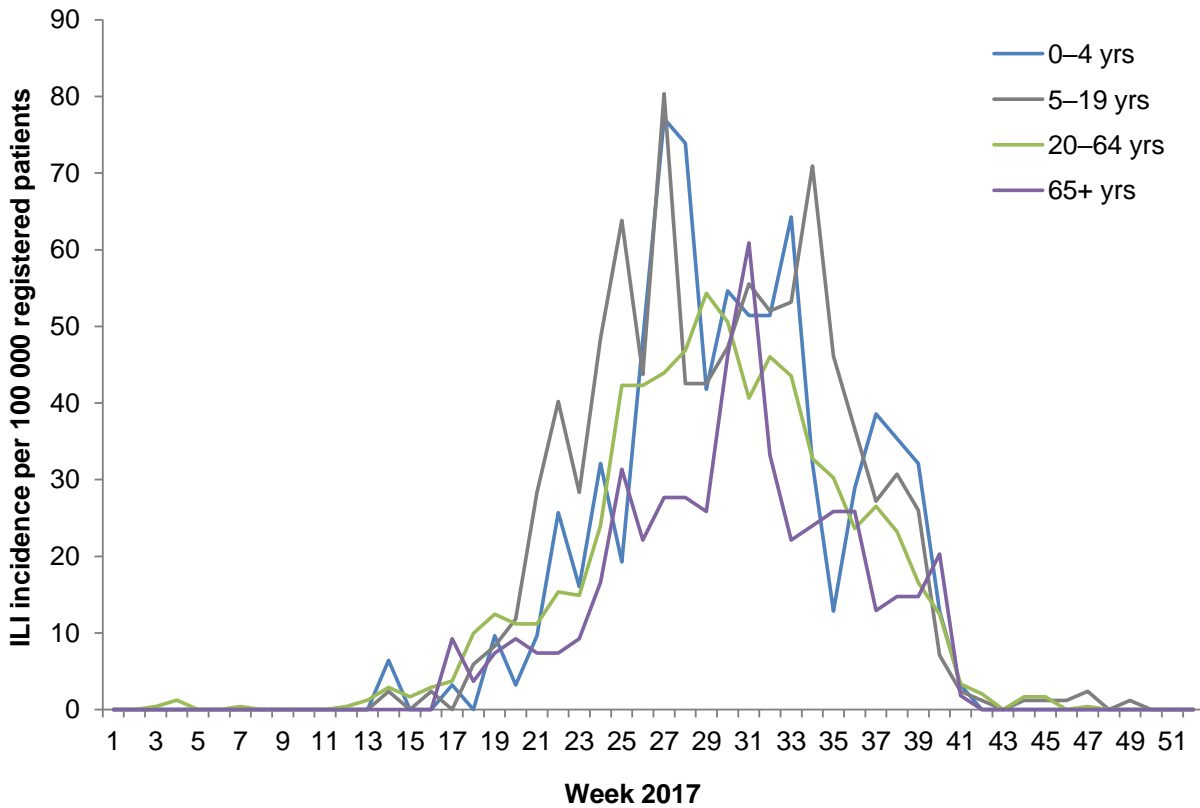
### Influenza-like illness (ILI)

During December, one patient with influenza-like illness consulted sentinel general practices in 20 DHBs. The monthly ILI incidence was 0.2 per 100 000 patient population.

**Figure 1. Weekly resident ILI and influenza incidence since 2 January 2017**



**Figure 2. Weekly ILI incidence by age group since 2 January 2017**



**Figure 3. Weekly ILI incidence by ethnicity since 2 January 2017**

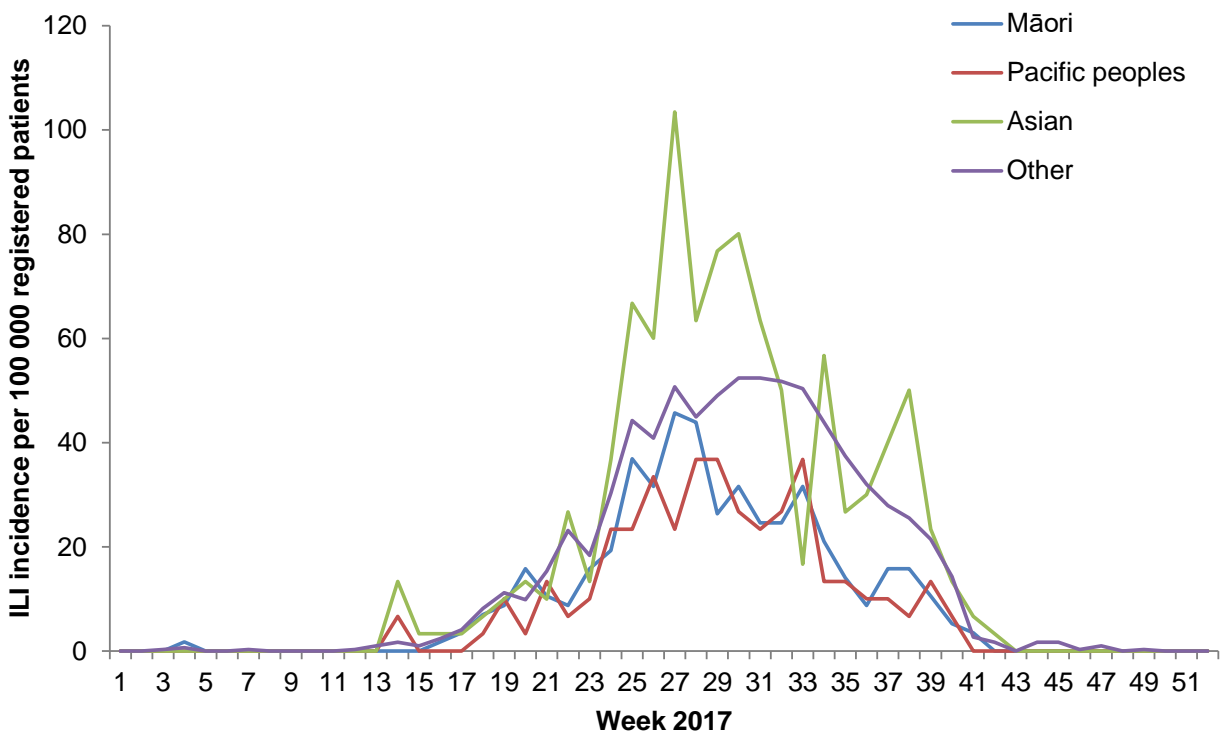


Figure 4 compares the consultation rates for influenza-like illness for each DHB since 2 January 2017.

**Figure 4. Rate of ILI consultations per 100 000 registered by DHB per week since 2 January 2017**



\*Results that have some uncertainty, with less than 5% of the DHB population covered (see Notes on Interpretation).  
 Note: Outliers have been omitted from this graph.

ILI consultation rates for any particular DHB should be treated with caution as they may not be representative of the real situation for a particular community or setting, especially if the surveillance system has a small number of participating General Practices in the DHB, or the GP enrolled patient population is small, the calculated ILI rates are subject to greater fluctuation.

Since 2 January 2017, a total of 2977 ILI cases were identified (Table 1). This gives an ILI cumulative incidence of 724.1 per 100 000 patient population.

**Table 1. Demographic characteristics of ILI and influenza cases, since 2 January 2017**

Characteristics	ILI & influenza cases among sentinel practices	
	ILI cases	ILI incidence (per 100 000)
<b>Overall</b>	<b>2977</b>	<b>724.1</b>
<b>Age group (years)</b>		
<1	42	635.4
1–4	202	824.2
5–19	772	912.4
20–34	480	558.7
35–49	689	840.5
50–64	517	705.0
65–79	227	555.9
>80	48	359.4
Unknown	0	
<b>Ethnicity</b>		
Māori	276	485.0
Pacific peoples	125	418.1
Asian	291	971.2
European and Other	2283	777.4
Unknown	2	0.0
<b>Sex</b>		
Female	1696	794.7
Male	1277	645.9
Unknown	4	

## Intensive Care Unit admissions among hospitalised patients

During December there were seven cases admitted to ICU. Six specimens were tested from seven ICU cases; none were positive for influenza viruses. Since 2 January 2017 there have been a total of 335 ICU cases. Twenty-seven of the 352 ICU specimens tested positive for influenza viruses (Table 2).

**Table 2. ICU influenza viruses since 2 January 2017**

<i>Influenza viruses</i>	ICU	
	All weeks	December
No. of specimens tested	352	6
No. of positive specimens (%) <sup>1</sup>	27 (7.7)	0 (0.0)
<b>Influenza A</b>	<b>17</b>	<b>0</b>
A (not subtyped)	4	0
A(H1N1)pdm09	4	0
A(H1N1)pdm09 by PCR	3	0
1	1	0
A/California/7/2009 (H1N1)pdm09 - like	0	0
A(H3N2)	9	0
A(H3N2) by PCR	8	0
A/Hong Kong/4801/2014 (H3N2) - like	1	0
<b>Influenza B</b>	<b>10</b>	<b>0</b>
B (lineage not determined)	8	0
B/Yamagata lineage	2	0
B/Yamagata lineage by PCR	2	0
B/Phuket/3073/2013 - like	0	0
B/Victoria lineage	0	0
B/Victoria lineage by PCR	0	0
B/Brisbane/60/2008 - like	0	0
<b>Influenza and non-influenza co-detection (% +ve)</b>	<b>3 (11.1)</b>	<b>0 (0.0)</b>

<sup>1</sup>Number of specimens positive for at least one of the listed viruses.

Note. A specimen may be positive for more than one virus; a patient may have more than one specimen tested.

**Table 3. ICU non-influenza viruses since 2 January 2017**

<i>Non-influenza respiratory viruses</i>	ICU	
	All weeks	December
No. of specimens tested	273	4
No. of positive specimens (%) <sup>1</sup>	161	0
Respiratory syncytial virus (RSV)	75	0
Parainfluenza 1 (PIV1)	1	0
Parainfluenza 2 (PIV2)	4	0
Parainfluenza 3 (PIV3)	15	0
Rhinovirus (RV)	78	0
Adenovirus (AdV)	19	0
Human metapneumovirus (hMPV)	5	0
Enterovirus	19	0
Single virus detection (% of positives)	114 (70.8)	0 (0.0)
Multiple virus detection (% of positives)	47 (29.2)	0 (0.0)

<sup>1</sup>Number of specimens positive for at least one of the listed viruses.

Note. A specimen may be positive for more than one virus; a patient may have more than one specimen tested.



## APPENDIX

**Table 4. Influenza-like illness count by DHB by week 18–52, 2017**

DHB	Week																																				
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52		
Auckland	15	14	15	18	30	25	45	71	58	83	78	62	82	69	58	60	64	47	38	49	46	31	14	2	2	0	0	0	1	0	0	0	0	0	0	0	
Bay of Plenty	0	0	0	0	2	1	1	6	7	11	4	4	5	6	7	7	11	9	2	2	7	5	1	1	1	0	2	2	0	0	0	0	0	0	0	0	
Canterbury	2	5	10	3	3	1	11	16	9	12	9	20	18	15	22	18	20	5	8	6	10	6	2	3	0	0	1	1	0	2	0	1	0	0	0		
Capital and Coast	2	2	3	4	11	9	13	6	8	25	18	22	13	7	16	23	7	5	6	6	3	3	1	1	0	0	1	0	0	0	0	0	0	0	0	0	
Counties Manukau	1	2	0	2	1	0	3	1	6	3	6	1	2	3	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hawke's Bay	0	0	1	3	1	1	3	0	4	4	8	2	3	8	7	3	1	2	3	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Hutt Valley	4	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lakes	0	0	0	1	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
MidCentral	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nelson Marlborough	0	3	2	0	1	0	4	3	2	2	4	9	3	4	7	3	2	0	1	1	1	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	
Northland	2	1	4	2	0	0	1	8	4	4	2	2	0	0	1	0	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Canterbury	1	3	1	2	0	0	2	2	2	1	0	5	11	9	9	16	24	7	6	9	0	8	18	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Southern	1	2	0	5	4	5	1	2	4	4	7	11	4	10	11	4	6	5	6	4	7	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tairāwhiti	0	0	1	2	4	2	2	7	3	2	2	4	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taranaki	1	0	0	1	0	0	1	3	1	2	1	1	0	0	2	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waikato	0	5	3	3	4	6	4	8	4	13	9	6	5	3	7	4	1	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wairarapa	0	0	0	0	0	0	0	0	5	2	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waitemata	1	6	2	8	22	16	24	44	41	37	30	44	50	52	37	39	24	40	36	26	24	16	11	4	0	0	0	0	0	0	0	0	0	0	0	0	0
West Coast	1	1	0	0	0	2	0	1	3	2	0	0	0	1	2	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Whanganui	0	0	1	4	0	1	2	0	5	5	5	0	6	4	1	1	1	0	0	0	1	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0
<b>New Zealand</b>	<b>31</b>	<b>44</b>	<b>43</b>	<b>58</b>	<b>83</b>	<b>70</b>	<b>118</b>	<b>179</b>	<b>166</b>	<b>213</b>	<b>187</b>	<b>194</b>	<b>204</b>	<b>194</b>	<b>189</b>	<b>182</b>	<b>162</b>	<b>130</b>	<b>111</b>	<b>106</b>	<b>101</b>	<b>80</b>	<b>51</b>	<b>12</b>	<b>6</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>		



**Table 5. Influenza-like illness rate by DHB by weeks 1–52, 2017**

DHB	Rate per 100 000																																				
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52		
Auckland	26.4	24.7	26.4	31.7	52.8	44.0	79.2	125.0	102.1	146.2	137.4	109.2	144.4	121.5	102.1	105.7	112.7	82.8	66.9	86.3	81.0	54.6	24.7	3.5	3.5	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Bay of Plenty	0.0	0.0	0.0	0.0	13.5	6.7	6.7	40.4	47.1	74.1	26.9	26.9	33.7	40.4	47.1	47.1	74.1	60.6	13.5	13.5	47.1	33.7	6.7	6.7	6.7	0.0	13.5	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Canterbury	2.8	7.1	14.2	4.3	4.3	1.4	15.6	22.8	12.8	17.1	12.8	28.4	25.6	21.3	31.3	25.6	28.4	7.1	11.4	8.5	14.2	8.5	2.8	4.3	0.0	0.0	1.4	1.4	0.0	2.8	0.0	1.4	0.0	0.0	0.0	0.0	
Capital and Coast	7.8	7.8	11.7	15.6	42.8	35.0	50.6	23.4	31.2	97.3	70.1	85.7	50.6	27.3	62.3	89.6	27.3	19.5	23.4	23.4	11.7	11.7	3.9	3.9	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Counties Manukau	3.0	6.0	0.0	6.0	3.0	0.0	9.0	3.0	18.0	9.0	18.0	3.0	6.0	9.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Hawke's Bay	0.0	0.0	5.2	15.7	5.2	5.2	15.7	0.0	20.9	20.9	41.7	10.4	15.7	41.7	36.5	15.7	5.2	10.4	15.7	10.4	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Hutt Valley	15.2	0.0	0.0	0.0	0.0	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lakes*	0.0	0.0	0.0	22.3	0.0	0.0	0.0	0.0	0.0	0.0	66.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
MidCentral*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Nelson Marlborough	0.0	29.2	19.5	0.0	9.7	0.0	39.0	29.2	19.5	19.5	39.0	87.7	29.2	39.0	68.2	29.2	19.5	0.0	9.7	9.7	9.7	19.5	9.7	0.0	0.0	0.0	0.0	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Northland	15.7	7.9	31.5	15.7	0.0	0.0	7.9	62.9	31.5	31.5	15.7	15.7	0.0	0.0	7.9	0.0	0.0	15.7	0.0	0.0	7.9	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
South Canterbury	9.3	27.8	9.3	18.6	0.0	0.0	18.6	18.6	18.6	9.3	0.0	46.4	102.1	83.5	83.5	148.5	222.7	65.0	55.7	83.5	0.0	74.2	167.0	9.3	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Southern	2.2	4.4	0.0	10.9	8.7	10.9	2.2	4.4	8.7	8.7	15.3	24.0	8.7	21.8	24.0	8.7	13.1	10.9	13.1	8.7	15.3	15.3	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tairāwhiti	0.0	0.0	14.4	28.9	57.7	28.9	28.9	101.0	43.3	28.9	28.9	57.7	28.9	28.9	28.9	28.9	14.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Taranaki	4.4	0.0	0.0	4.4	0.0	0.0	4.4	13.1	4.4	8.7	4.4	4.4	0.0	0.0	8.7	4.4	0.0	4.4	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Waikato*	0.0	32.5	19.5	19.5	26.0	39.0	26.0	52.1	26.0	84.6	58.6	39.0	32.5	19.5	45.5	26.0	6.5	45.5	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Wairarapa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200.0	80.0	40.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Waitematā*	7.9	47.5	15.8	63.3	174.0	126.6	189.8	348.0	324.3	292.7	237.3	348.0	395.5	411.3	292.7	308.5	189.8	316.4	284.7	205.6	189.8	126.6	87.0	31.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
West Coast	6.3	6.3	0.0	0.0	0.0	12.7	0.0	6.3	19.0	12.7	0.0	0.0	0.0	6.3	12.7	0.0	0.0	6.3	6.3	0.0	0.0	0.0	6.3	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Whanganui*	0.0	0.0	60.2	241.0	0.0	60.2	120.5	0.0	301.2	301.2	301.2	0.0	361.4	241.0	60.2	60.2	60.2	0.0	0.0	0.0	60.2	0.0	60.2	0.0	60.2	0.0	60.2	0.0	60.2	0.0	60.2	0.0	60.2	0.0	60.2	0.0	
<b>New Zealand</b>	<b>7.5</b>	<b>10.7</b>	<b>10.5</b>	<b>14.1</b>	<b>20.2</b>	<b>17.0</b>	<b>28.7</b>	<b>43.5</b>	<b>40.4</b>	<b>51.8</b>	<b>45.5</b>	<b>47.2</b>	<b>49.6</b>	<b>47.2</b>	<b>46.0</b>	<b>44.3</b>	<b>39.4</b>	<b>31.6</b>	<b>27.0</b>	<b>25.8</b>	<b>24.6</b>	<b>19.5</b>	<b>12.4</b>	<b>2.9</b>	<b>1.5</b>	<b>0.0</b>	<b>1.2</b>	<b>1.2</b>	<b>0.2</b>	<b>0.7</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>		





Recent global experience with pandemic influenza A(H1N1)pdm09 highlights the importance of monitoring severe and mild respiratory disease to support pandemic preparedness as well as seasonal influenza prevention and control. Two active, prospective, population-based surveillance systems were used to monitor influenza and other respiratory pathogens: 1) among those registered patients seeking consultations with influenza-like illness (ILI) at sentinel general practices nation-wide; 2) among those hospitalized patients with severe acute respiratory illness (SARI) in Auckland and Counties Manukau District Health Boards (ADHB and CMDHB).

The aims of ILI and SARI surveillance are: 1) to measure the burden of severe and moderate disease caused by influenza and other respiratory pathogens; 2) to monitor trends in severe and moderate disease caused by influenza and other respiratory pathogens; 3) to identify high risk groups that should be prioritized for prevention and treatment; 4) to monitor antigenic, genetic and antiviral characteristics of influenza viruses associated with severe and mild disease. 5) to provide a study base to estimate the effectiveness of influenza vaccine.

### ACKNOWLEDGEMENT

We acknowledge the support of the New Zealand Ministry of Health. SARI surveillance was established and funded by the US CDC, and continues to operate through funding from the New Zealand Ministry of Health.

### DESCRIPTION OF ILI ACTIVITY THRESHOLDS

The values for the different intensity levels for 2017 are listed in the table below. This is based on New Zealand’s consultation rates from 2000–2015 (excluding the pandemic year, 2009) and WHO’s interim guidance severity assessment

Below seasonal level (baseline, per 100,000)	Seasonal level (per 100,000)			Above seasonal level (per 100,000)
	low	moderate	high	
<35.1	35.1-82.5	82.5-168.9	168.9-231.8	>231.8

- The baseline threshold indicates the level of influenza activity that signals the start and end of the annual influenza season and it is based on the Moving Epidemic Method (MEM) ( *Vega et al. Influenza and other respiratory viruses 2013;7(4):546-558*).
- Seasonal levels (low, moderate and high) are estimated as the upper limits of the 40%, 90% and 97.5% one-sided confidence intervals of the geometric mean of 30 highest epidemic weekly rates using the MEM method. As many other countries use this method, it allows the NZ data to be interpreted not just at the country level but also comparable with other countries.
- The average seasonal curve indicates the usual seasonal activity that may occur during a typical year using the method described in “*Global epidemiological surveillance standards for influenza*” ([http://www.who.int/influenza/resources/documents/WHO\\_Epidemiological\\_Influenza\\_Surveillance\\_Standards\\_2014.pdf](http://www.who.int/influenza/resources/documents/WHO_Epidemiological_Influenza_Surveillance_Standards_2014.pdf)).

## NOTES ON INTERPRETATION

- SARI case definition: “An acute respiratory illness with a history of fever or measured fever of  $\geq 38^{\circ}\text{C}$ , AND cough, AND onset within the past 10 days, AND requiring inpatient hospitalisation (defined as a patient who is admitted under a medical team and to a hospital ward or assessment unit)”. A non-SARI case is a hospitalised respiratory patient who does not meet the SARI case definition.
- ILI case definition: “An acute respiratory illness with a history of fever or measured fever of  $\geq 38^{\circ}\text{C}$ , AND cough, AND onset within the past 10 days, AND requiring GP consultation”.
- ILI sentinel general practices: a total of 74 sentinel general practices have agreed to participate in community ILI surveillance. These practices have ~400 000 registered patients, covering roughly 9% of the NZ population.
- SARI sentinel hospitals serving a population of 906 000 people: Auckland City Hospital and the associated Starship Children’s Hospital (ADHB), and Middlemore Hospital and the associated Kidz First Children’s Hospital (CMDHB).
- The real-time PCR assay for influenza virus uses CDC’s protocol ([http://www.accessdata.fda.gov/cdrh\\_docs/pdf8/k080570.pdf](http://www.accessdata.fda.gov/cdrh_docs/pdf8/k080570.pdf));
- The real-time PCR assay for non-influenza respiratory viruses (respiratory syncytial virus, parainfluenza virus types 1-3, human metapneumovirus, rhinovirus and adenovirus) uses CDC’s protocol. Note: The rhinovirus PCR detects mostly rhinovirus with slight cross-reactivity against enterovirus.
- The surveillance week is Monday to Sunday inclusive, and data are extracted on the subsequent Tuesday. Results from previous weeks will be revised as data are updated (laboratory test results in particular may be delayed).
- ILI consultation rates for any particular DHB should be treated with caution. If the surveillance system has a small number of participating General Practices in the DHB, or the GP enrolled patient population is small, the calculated ILI rates are subject to greater fluctuation.

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