

# Community and Hospital Surveillance

## ILI, SARI, Influenza and Respiratory Pathogens

2017 Influenza Season, Week 29, ending 23 July 2017

### SUMMARY

- Influenza-like illness (ILI) consultation rates increased slightly compared to the previous week, and remained above the seasonal threshold level. The overall influenza positivity rate of tested samples has remained at a high level (~45%). Influenza rates were highest in school-aged children (5–19 years), and those of Asian ethnicity.
- Severe acute respiratory illness (SARI) hospitalisation rates increased, with high proportions of influenza virus specimens (~50%). Influenza hospitalisations were highest in infants (<1 year) and older people (80+ years), as well as Pacific People.
- Influenza A(H3N2) are the predominant viruses in New Zealand this year. A(H3N2) viruses are known to change more quickly over time than the other human influenza viruses, as illustrated by the frequency of formulation changes of the A(H3N2) component of the vaccine. The A(H3N2) viruses have changed genetically. However, it is too early to predict whether these genetic changes will lead to any antigenic changes that reduce vaccine effectiveness. The data for vaccine effectiveness will be available at the end of this influenza season.
- Influenza B/Victoria lineage viruses also co-circulated with B/Yamagata lineage viruses with more B/Yamagata viruses. Quadrivalent vaccine covered both B lineages whereas trivalent vaccine only covered one lineage (B/Victoria). Cross-protection between two B lineages has been documented previously through vaccine effectiveness study and seroprevalence study.
- Non-influenza respiratory viruses also circulated with rhinovirus and respiratory syncytial virus (RSV) most commonly detected.

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 weekly report summarises data obtained from the ILI and SARI surveillance platforms. The report includes incidence, demographic characteristics, clinical outcomes and aetiologies for community ILI cases as well as hospital SARI cases including ICU admissions and deaths for the past week as well as the cumulative period since 2 January 2017.

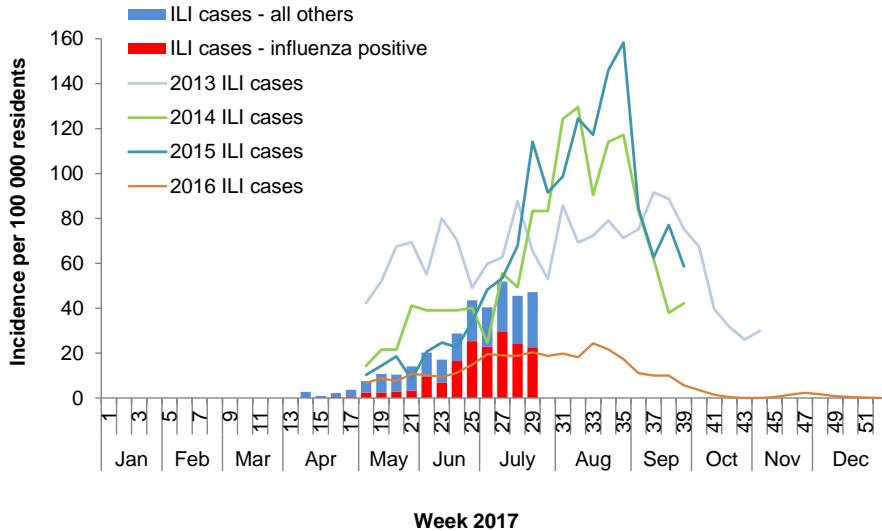
Note: Data in this report are provisional and may change as more cases are assessed and information is updated. Data were extracted on 27 July 2017.

# INFLUENZA-LIKE ILLNESS and SEVERE ACUTE RESPIRATORY ILLNESS

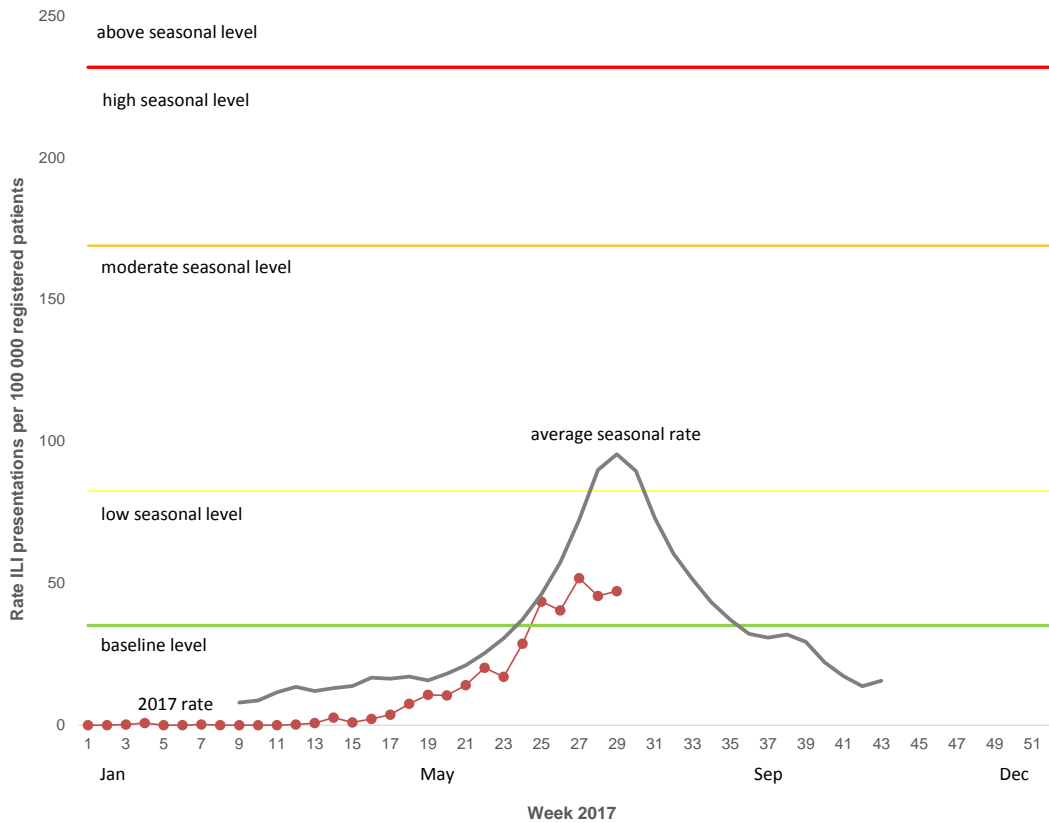
## Influenza-like illness (ILI)

During week 29, ending 23 July 2017, 194 patients with influenza-like illness consulted sentinel general practices in 20 DHBs. The weekly ILI incidence was 47.2 per 100 000 patient population (Figures 1 and 2). Of the 159 tested ILI cases, 76 were positive for influenza viruses. This gives an ILI related influenza incidence (adjusted) of 22.6 per 100 000 patient population.

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

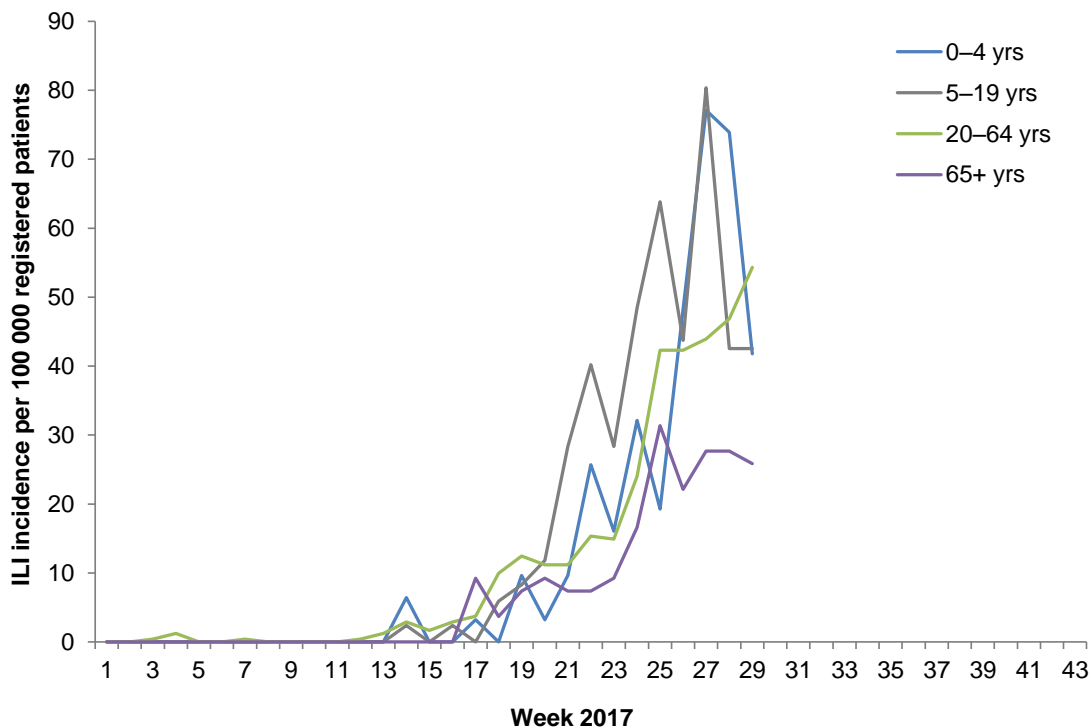


**Figure 2. Comparison of 2017 rate with average seasonal rate, and historical thresholds**



The weekly consultation rates for influenza-like illness by different age groups and ethnicities are shown in Figures 3 and 4.

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



**Figure 4. Weekly ILI incidence by ethnicity since 2 January 2017**

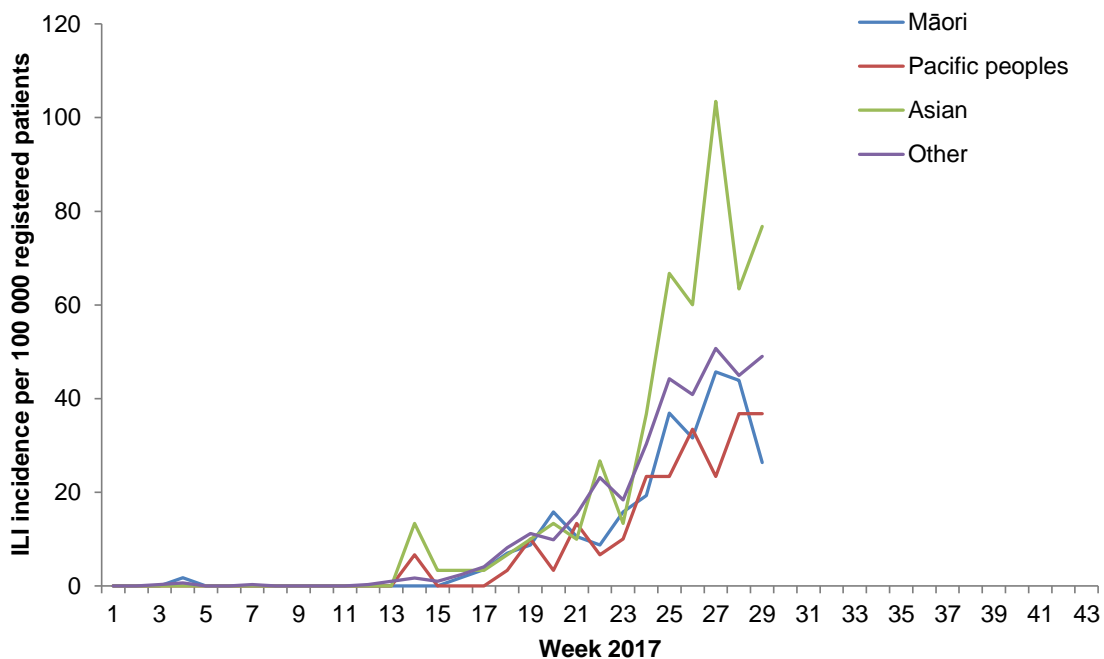
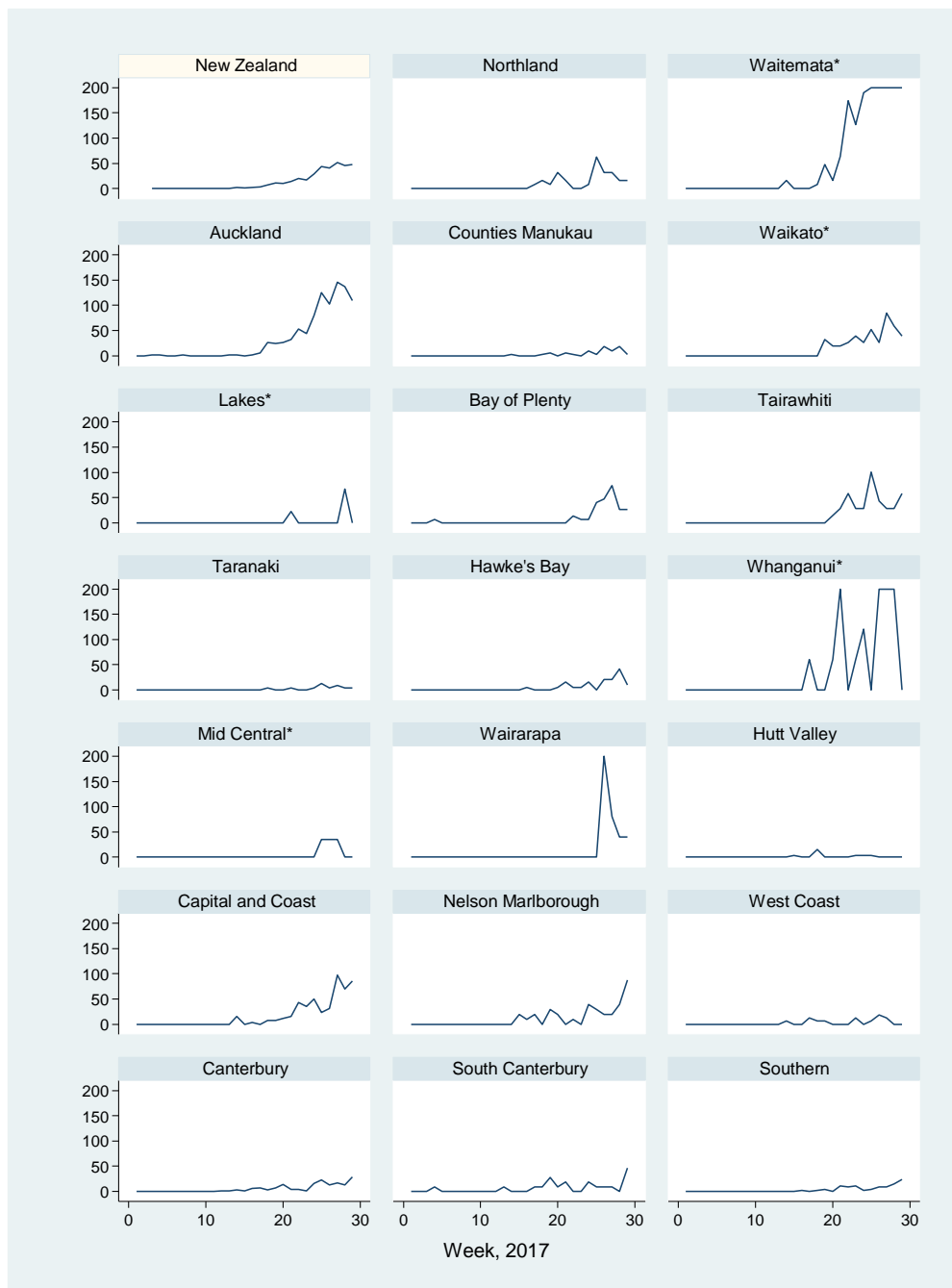


Figure 5 compares the consultation rates for influenza-like illness for each DHB over the past week. Waitemata (348.0 per 100 000, 44 cases), Auckland (109.2 per 100 000, 62 cases), and Nelson Marlborough (87.7 per 100 000, 9 cases) DHBs had the highest consultation rates.

**Figure 5. 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 1434 ILI cases were identified. This gives a cumulative ILI incidence of 348.8 per 100 000 patient population (Table 1). Among the 1174 tested ILI cases, 581 (49.5%) were positive for influenza viruses. This gives an ILI related (adjusted) influenza incidence of 172.6 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	Influenza cases	Prop Influenza positive <sup>1</sup> (%)	ILI incidence (per 100 000)	Influenza incidence <sup>2</sup> (per 100 000)
<b>Overall</b>	<b>1434</b>	<b>581</b>	<b>49.5 (100.0)</b>	<b>348.8</b>	<b>172.6</b>
<b>Age group (years)</b>					
<1	15	2	16.7 (0.3)	226.9	37.8
1–4	99	27	31.4 (4.6)	403.9	126.8
5–19	380	197	63.5 (33.9)	449.1	285.4
20–34	231	78	40.4 (13.4)	268.9	108.7
35–49	350	141	50.4 (24.3)	427.0	215.0
50–64	248	96	47.8 (16.5)	338.2	161.5
65–79	92	30	40.5 (5.2)	225.3	91.3
>80	19	10	55.6 (1.7)	142.2	79.0
Unknown	0	0	0.0		
<b>Ethnicity</b>					
Māori	158	60	46.5 (10.3)	277.6	129.1
Pacific peoples	69	28	50.9 (4.8)	230.8	117.5
Asian	153	84	60.0 (14.5)	510.6	306.4
European and Other	1052	409	48.2 (70.4)	358.2	172.6
Unknown	0	0	0.0	0.0	
<b>Sex</b>					
Female	786	315	50.1 (54.2)	368.3	184.4
Male	647	266	48.8 (45.8)	327.2	159.7
Unknown	1	0	0.0		

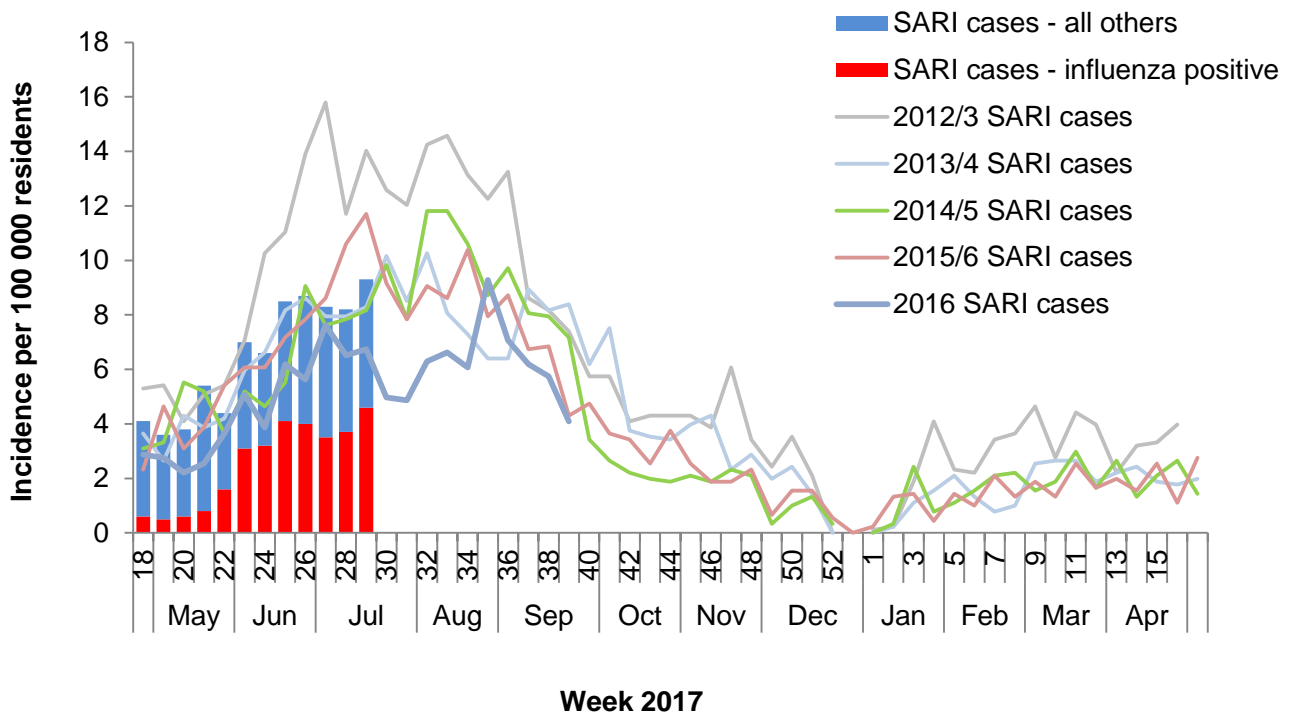
<sup>1</sup>Proportion of cases tested which were positive for influenza viruses

<sup>2</sup>Adjusted to positivity of tested cases

## Severe acute respiratory illness (SARI)

There were 2813 acute admissions to ADHB and CMDHB hospitals during week 29, ending 23 July 2017. A total of 166 patients with acute respiratory illness were assessed in these hospitals. Of these, 105 (63.3%) patients met the SARI case definition. Seven cases were admitted to ICU and no SARI related deaths were reported this week. Of the 32 tested residents with SARI, 16 were positive for influenza viruses, giving a SARI related influenza incidence of 4.6 per 100 000 population this week.

**Figure 6. Weekly resident SARI and influenza incidence since 2 May 2016 and previous seasons SARI incidence**



Since 1 May 2017, a total of 921 SARI cases were identified. This gives a SARI proportion of 27.0 per 1000 acute hospitalisations (Table 2). Sixty-three SARI cases have been admitted to ICU and nine SARI related deaths were reported during this period.

Of the 921 SARI cases, 705 were ADHB and CMDHB residents, giving a SARI incidence of 77.8 per 100 000 population (Table 2). Among the 603 tested SARI cases who were ADHB and CMDHB residents, 229 (38.0%) had positive influenza virus results. This gives a SARI (adjusted) related influenza incidence of 29.6 per 100 000 population.

**Table 2. Demographic characteristics of SARI cases and related influenza cases, since 1 May 2017**

Characteristics	Admissions	Assessed	SARI & influenza cases among all hospital patients			SARI & influenza cases among ADHB & CMDHB residents			
			SARI Cases (%)	Cases per 1000 hospitalisations	Influenza positive <sup>1</sup> (%)	SARI cases	SARI incidence (per 100 000)	Influenza Cases	Influenza incidence (per 100 000)
<b>Overall</b>	<b>34052</b>	<b>1853</b>	<b>921 (49.7)</b>	<b>27.0</b>	<b>244 (38.0)</b>	<b>705</b>	<b>77.8</b>	<b>229</b>	<b>29.6</b>
<b>Age group (years)</b>									
<1	1219		140	114.8	14 (12.8)	128	947.7	13	124.4
1–4	2376		99	41.7	18 (23.1)	91	172.1	17	40.6
5–19	4061		53	13.1	13 (29.5)	44	22.8	10	6.2
20–34	6413		48	7.5	21 (46.7)	48	23.0	21	10.7
35–49	5021		56	11.2	21 (41.2)	54	28.3	21	12.1
50–64	5820		115	19.8	59 (55.1)	113	75.1	57	40.8
65–79	5533		138	24.9	54 (45.0)	131	179.2	49	77.7
>80	3609		99	27.4	43 (50.0)	96	409.7	41	202.4
Unknown	0		173			0		0	
<b>Ethnicity</b>									
Māori	4640		146	31.5	31 (24.8)	130	130.7	29	34.5
Pacific peoples	7329		261	35.6	84 (38.4)	255	184.8	80	69.4
Asian	5631		60	10.7	23 (44.2)	58	27.6	22	11.9
European and Other	16233		281	17.3	105 (43.0)	262	65.2	98	27.9
Unknown	179		173	966.5		0		0	
<b>Hospitals</b>									
ADHB	19966	731	460 (62.9)	23.0	129 (44.9)	286	65.5	117	30.1
CMDHB	14086	1122	461 (41.1)	32.7	115 (32.4)	419	89.3	112	28.7
<b>Sex</b>									
Female	18033		402	22.3	134 (39.0)	375	80.6	127	31.9
Male	16016		344	21.5	108 (36.7)	328	74.5	101	26.9
Unknown	3		175			2		1	

<sup>1</sup>Proportion of cases tested which were positive for influenza viruses

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

## RESPIRATORY PATHOGEN SURVEILLANCE

### Influenza virus

During week 29, 159 ILI specimens were tested; 76 were positive for influenza viruses. In addition, 40 SARI specimens were tested; 17 were positive for influenza viruses.

Since 1 May 2017, 1158 ILI specimens were tested, 580 (50.1%) were positive for influenza with the following viruses. In addition, 738 SARI specimens were tested, 271 (36.7%) were positive for influenza viruses (see Table 3).

**Table 3. Influenza viruses among ILI and SARI cases since 1 May 2017**

<i>Influenza viruses</i>	ILI	SARI	SARI and non-SARI	
	Cases (%)	Cases (%)	ICU (%)	Deaths (%)
No. of specimens tested	1158	738	136	14
No. of positive specimens (%) <sup>1</sup>	580 (50.1)	271 (36.7)	16 (11.8)	5 (35.7)
<b>Influenza A</b>	<b>353</b>	<b>204</b>	<b>8</b>	<b>2</b>
A (not subtyped)	18	83	4	1
A(H1N1)pdm09	34	17	0	0
A(H1N1)pdm09 by PCR	24	16	0	0
A/California/7/2009 (H1N1)pdm09 - like	10	1	0	0
A(H3N2)	301	104	4	1
A(H3N2) by PCR	275	104	4	1
A/Hong Kong/4801/2014 (H3N2) - like	26	0	0	0
<b>Influenza B</b>	<b>227</b>	<b>67</b>	<b>8</b>	<b>3</b>
B (lineage not determined)	18	34	6	2
B/Yamagata lineage	199	33	2	1
B/Yamagata lineage by PCR	123	21	2	1
B/Phuket/3073/2013 - like	76	12	0	0
B/Victoria lineage	10	0	0	0
B/Victoria lineage by PCR	10	0	0	0
B/Brisbane/60/2008 - like	0	0	0	0
<b>Influenza and non-influenza co-detection (% +ve)</b>	<b>30 (5.2)</b>	<b>12 (4.4)</b>	<b>1 (6.3)</b>	<b>1 (20.0)</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.

The recommended influenza vaccine formulation for trivalent vaccine for New Zealand in 2017 is:

- A(H1N1) an A/Michigan/45/2015 (H1N1)pdm09-like virus
- A(H3N2) an A/Hong Kong/4801/2014 (H3N2)-like virus
- B a B/Brisbane/60/2008-like virus (belonging to B/Victoria lineage)

Quadrivalent vaccines contain the above three viruses plus one more vaccine component: B/Phuket/3073/2013-like virus (belonging to B/Yamagata lineage)

Note: Antigenic characterization of the current A(H3N2) viruses have been technically challenging because many viruses had low or undetectable haemagglutination activity. This phenomenon has been well recognized globally and documented in WHO's Weekly Epidemiological Record: <http://apps.who.int/iris/bitstream/10665/254756/1/WER9211.pdf?ua=1>



## Non-influenza respiratory pathogens

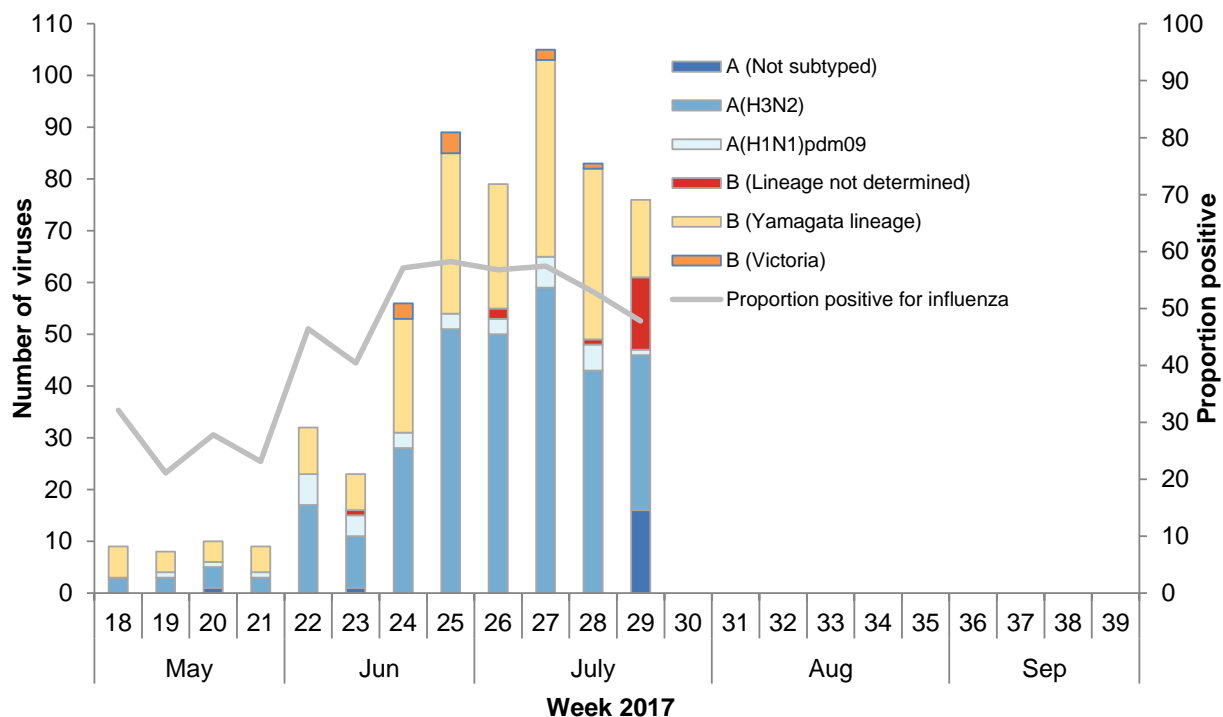
Since 1 May 2017, 1127 ILI specimens were tested for non-influenza viruses, 214 (19.0%) were positive with the following viruses. Five hundred and ninety-six SARI specimens were tested for non-influenza viruses, 170 (28.5%) were positive with the following viruses (see Table 4).

**Table 4. Non-influenza viruses among ILI and SARI cases since 1 May 2017<sup>1</sup>**

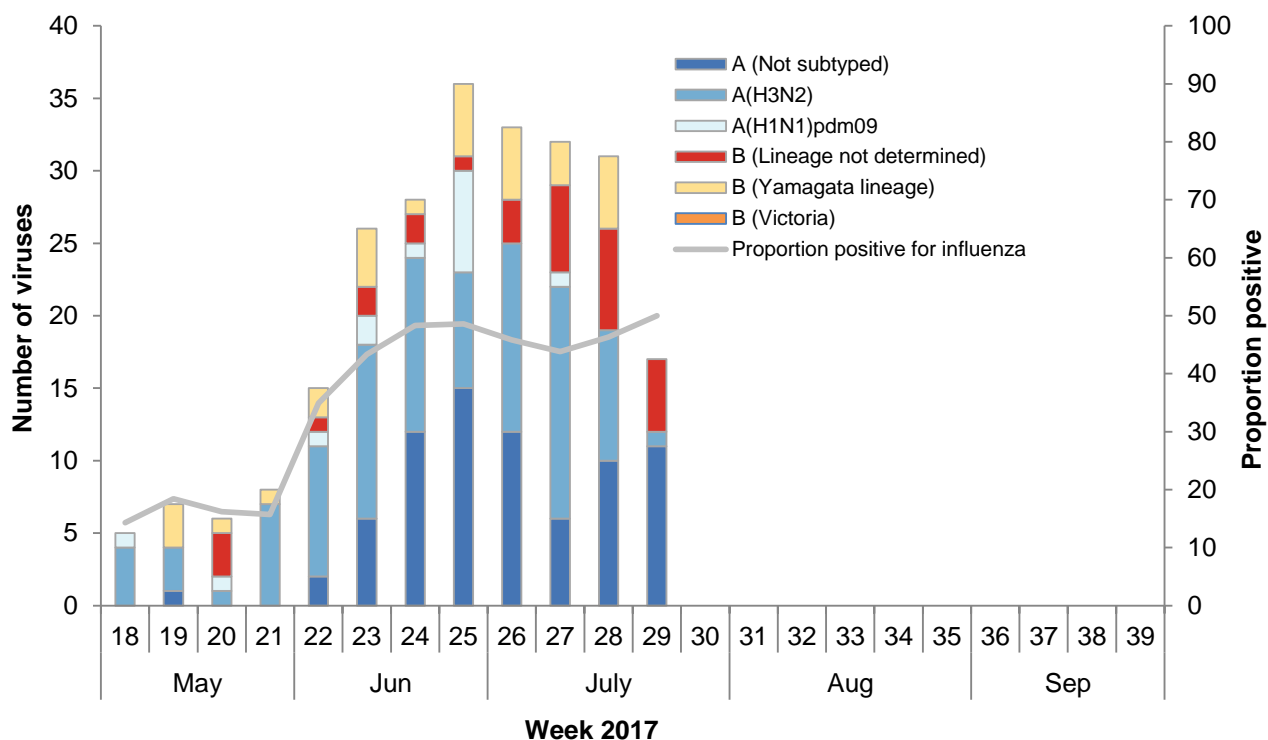
<i>Non-influenza respiratory viruses</i>	ILI	SARI	SARI and non-SARI	
	Cases (%)	Cases (%)	ICU (%)	Deaths (%)
No. of specimens tested	1127	596	81	14
No. of positive specimens (%) <sup>1</sup>	214 (19.0)	170 (28.5)	44 (54.3)	1 (7.1)
Respiratory syncytial virus (RSV)	58	91	19	1
Parainfluenza 1 (PIV1)	3	0	0	0
Parainfluenza 2 (PIV2)	21	8	1	0
Parainfluenza 3 (PIV3)	20	8	3	0
Rhinovirus (RV)	82	61	24	0
Adenovirus (AdV)	23	16	4	0
Human metapneumovirus (hMPV)	9	8	1	0
Enterovirus	12	6	3	0
Single virus detection (% of positives)	202 (94.4)	144 (84.7)	34 (77.3)	0 (-)
Multiple virus detection (% of positives)	12 (5.6)	26 (15.3)	10 (22.7)	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

**Figure 7. Temporal distribution of the number and proportion of influenza viruses from ILI specimens by type and week<sup>1</sup>**

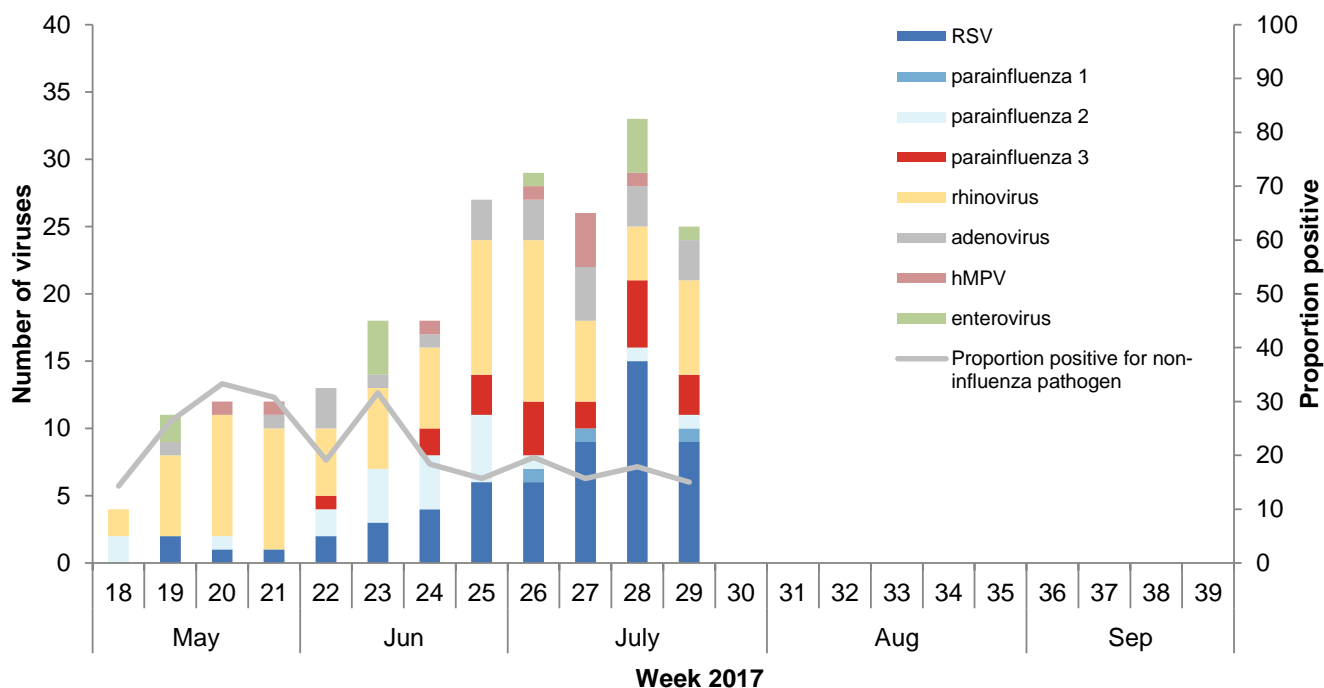


**Figure 8. Temporal distribution of the number and proportion of influenza viruses from SARI specimens by type and week<sup>1</sup>**

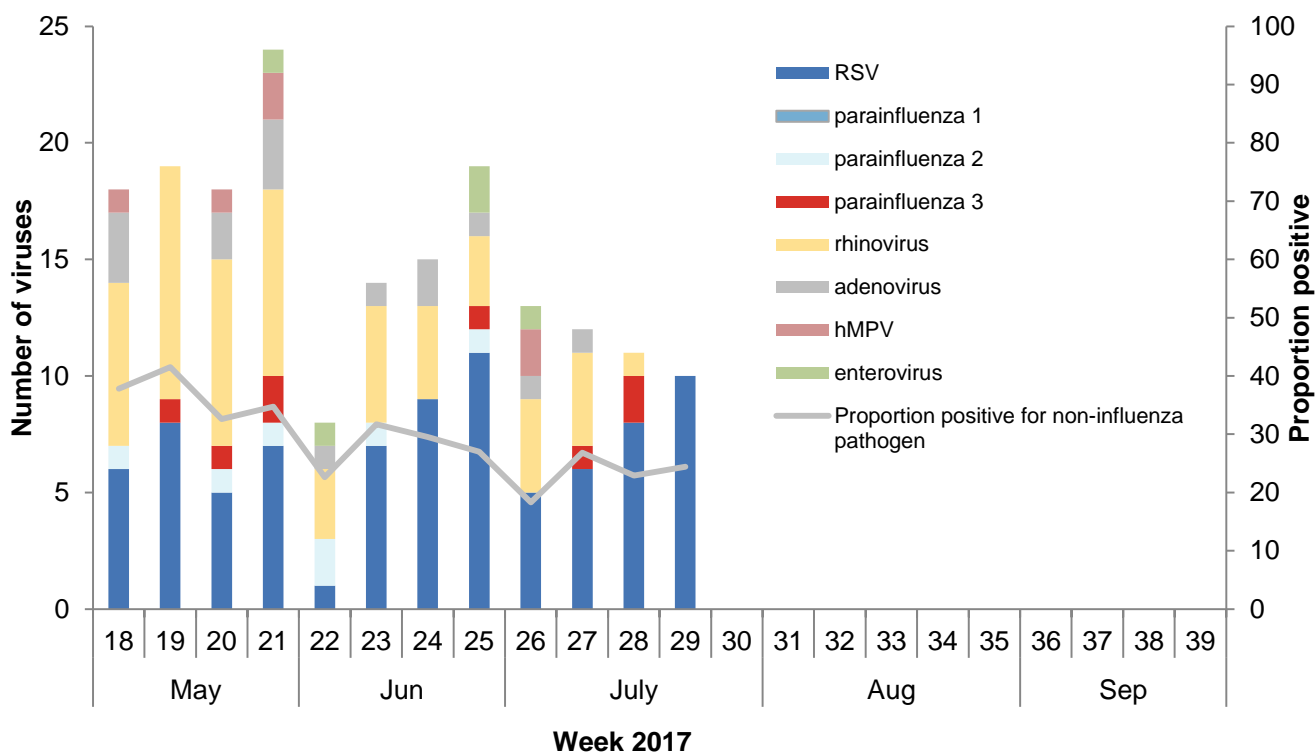




**Figure 9. Temporal distribution of the number and proportion of non-influenza viruses from ILI specimens by type and week<sup>1</sup>**



**Figure 10. Temporal distribution of the number and proportion of non-influenza viruses from SARI specimens by type and week<sup>1</sup>**



<sup>1</sup>Figures for recent weeks will be underestimates due to time lag in receiving laboratory test results.



## APPENDIX

Table 5. Influenza-like illness count by DHB by week 1–29, 2017

DHB	Week																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Auckland	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	1	3	15	14	15	18	30	25	45	71	58	83	78	62
Bay of Plenty	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	6	7	11	4	4
Canterbury	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	4	5	2	5	10	3	3	1	11	16	9	12	9	20
Capital and Coast	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	2	2	3	4	11	9	13	6	8	25	18	22
Counties Manukau	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	2	1	0	3	1	6	3	6	1
Hawke's Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3	1	1	3	0	4	4	8	2
Hutt Valley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	0	0	1	1	1	0	0	0	0
Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	0
MidCentral	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
Nelson Marlborough	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	3	2	0	1	0	4	3	2	2	4	9
Northland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	4	2	0	0	1	8	4	4	4	2	2
South Canterbury	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	3	1	2	0	0	2	1	1	1	0	5
Southern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	5	4	5	1	2	4	4	7	11	
Tairāwhiti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	2	2	7	3	2	2	4	
Taranaki	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	3	1	2	1	1	
Waikato	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	3	4	6	4	8	4	13	9	6	
Wairarapa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2	1	1	
Waitemata	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	6	2	8	22	16	24	44	41	37	30	44	
West Coast	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	1	0	0	0	2	0	1	3	2	0	0	
Whanganui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4	0	1	2	0	5	5	5	0	
<b>New Zealand</b>			<b>1</b>	<b>3</b>			<b>1</b>					<b>1</b>	<b>3</b>	<b>11</b>	<b>4</b>	<b>9</b>	<b>15</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>



**Table 6. Influenza-like illness rate by DHB by week 1–29, 2017**

DHB	Rate per 100 000																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Auckland	0.0	0.0	1.8	1.8	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	1.8	1.8	0.0	1.8	5.3	26.4	24.7	26.4	31.7	52.8	44.0	79.2	125.0	102.1	146.2	137.4	109.2
Bay of Plenty	0.0	0.0	0.0	6.7	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	13.5	6.7	6.7	40.4	47.1	74.1	26.9	26.9
Canterbury	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	2.8	1.4	5.7	7.1	2.8	7.1	14.2	4.3	4.3	1.4	15.6	22.8	12.8	17.1	12.8	28.4
Capital and Coast	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	15.6	0.0	3.9	0.0	7.8	7.8	11.7	15.6	42.8	35.0	50.6	23.4	31.2	97.3	70.1	85.7
Counties Manukau	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	3.0	0.0	0.0	0.0	3.0	6.0	0.0	6.0	3.0	0.0	9.0	3.0	18.0	9.0	18.0	3.0
Hawke's Bay	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	5.2	0.0	0.0	0.0	5.2	15.7	5.2	5.2	15.7	0.0	20.9	20.9	41.7	10.4
Hutt Valley	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	3.8	0.0	0.0	15.2	0.0	0.0	0.0	0.0	3.8	3.8	3.8	0.0	0.0	0.0	0.0
Lakes*	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	22.3	0.0	0.0	0.0	0.0	0.0	0.0	66.8	0.0
MidCentral*	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	35.5	35.5	35.5	0.0	0.0
Nelson Marlborough	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	19.5	9.7	19.5	0.0	29.2	19.5	0.0	9.7	0.0	39.0	29.2	19.5	19.5	39.0	87.7
Northland	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	7.9	15.7	7.9	31.5	15.7	0.0	0.0	7.9	62.9	31.5	31.5	15.7	15.7
South Canterbury	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0	0.0	0.0	9.3	9.3	27.8	9.3	18.6	0.0	0.0	18.6	9.3	9.3	9.3	0.0	46.4
Southern	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	2.2	0.0	2.2	4.4	0.0	10.9	8.7	10.9	2.2	4.4	8.7	8.7	15.3	24.0
Tairāwhiti	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	14.4	28.9	57.7	28.9	28.9	101.0	43.3	28.9	28.9	57.7
Taranaki	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	4.4	0.0	0.0	4.4	0.0	0.0	4.4	13.1	4.4	8.7	4.4	4.4
Waikato*	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	32.5	19.5	19.5	26.0	39.0	26.0	52.1	26.0	84.6	58.6	39.0
Wairarapa	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	200.0	80.0	40.0	40.0
Waitematā*	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	15.8	0.0	0.0	0.0	7.9	47.5	15.8	63.3	174.0	126.6	189.8	348.0	324.3	292.7	237.3	348.0
West Coast	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	6.3	0.0	0.0	12.7	6.3	6.3	0.0	0.0	0.0	12.7	0.0	6.3	19.0	12.7	0.0	0.0
Whanganui*	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	60.2	0.0	0.0	60.2	241.0	0.0	60.2	120.5	0.0	301.2	301.2	301.2	0.0
<b>New Zealand</b>			<b>0.2</b>	<b>0.7</b>			<b>0.2</b>					<b>0.2</b>	<b>0.7</b>	<b>2.7</b>	<b>1.0</b>	<b>2.2</b>	<b>3.6</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>

\*Results that have some uncertainty, with less than 5% of the DHB population covered (see Notes on Interpretation).



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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