

Community and Hospital Surveillance

ILI, SARI, Influenza and Respiratory Pathogens

2017 Influenza Season, Week 21, ending 28 May 2017

SUMMARY

During week 21 (22–28 May 2017), influenza activity was very low among consultation-seeking patients nationwide. Influenza activity was also low among those hospitalised patients in Auckland and Counties Manukau District Health Boards.

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

ILI surveillance: 58 patients with influenza-like illness consulted sentinel general practices in 20 DHBs. The weekly ILI incidence was 14.1 per 100 000 patient population (Figure 1), below the seasonal threshold of ILI consultations.

SARI surveillance: There were 2746 acute admissions to ADHB and CMDHB hospitals this week. Of the 113 patients with suspected respiratory infections, 54 (47.8%) patients met the SARI case definition. Three SARI cases were admitted to ICU and no SARI related deaths were reported. The weekly SARI incidence was 4.7 per 100 000 population. The SARI related influenza incidence was 0.6 per 100 000 population.

- **Respiratory pathogen surveillance**

Influenza virus: During this week, 25 ILI specimens were tested, seven were positive for influenza viruses. In addition, 43 SARI specimens were tested, five were positive for influenza viruses. For details, see Table 3 and Figures 7 and 8.

Non-influenza respiratory viruses: For cumulative totals, see Table 4 and Figures 9 and 10.

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 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 31 May 2017.

INFLUENZA-LIKE ILLNESS and SEVERE ACUTE RESPIRATORY ILLNESS

Influenza-like illness (ILI)

During week 21, ending 28 May 2017, 58 patients with influenza-like illness consulted sentinel general practices in 20 DHBs. The weekly ILI incidence was 14.1 per 100 000 patient population (Figures 1 and 2). Of the 25 tested ILI cases, seven were positive for influenza viruses. This gives an ILI related influenza incidence (adjusted) of 4.0 per 100 000 patient population.

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

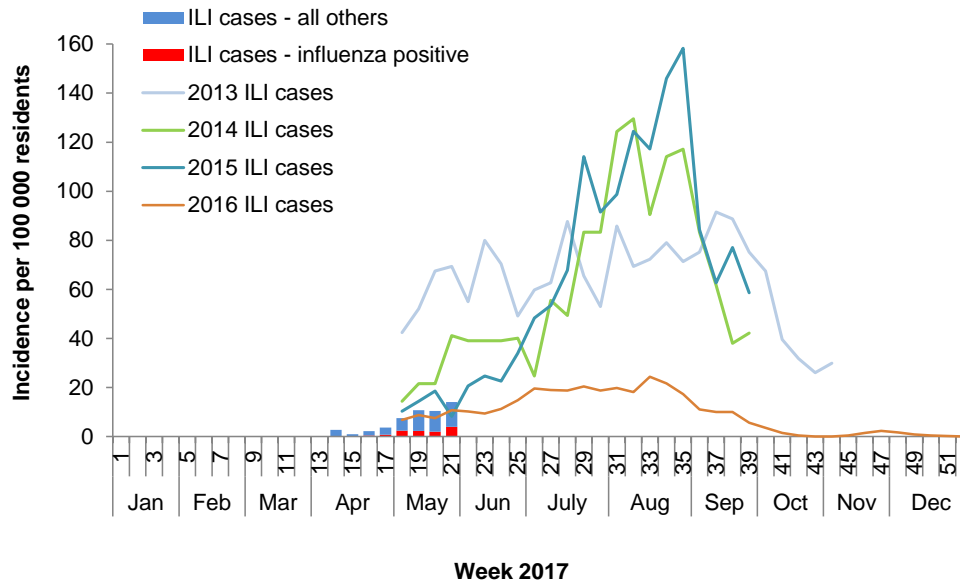
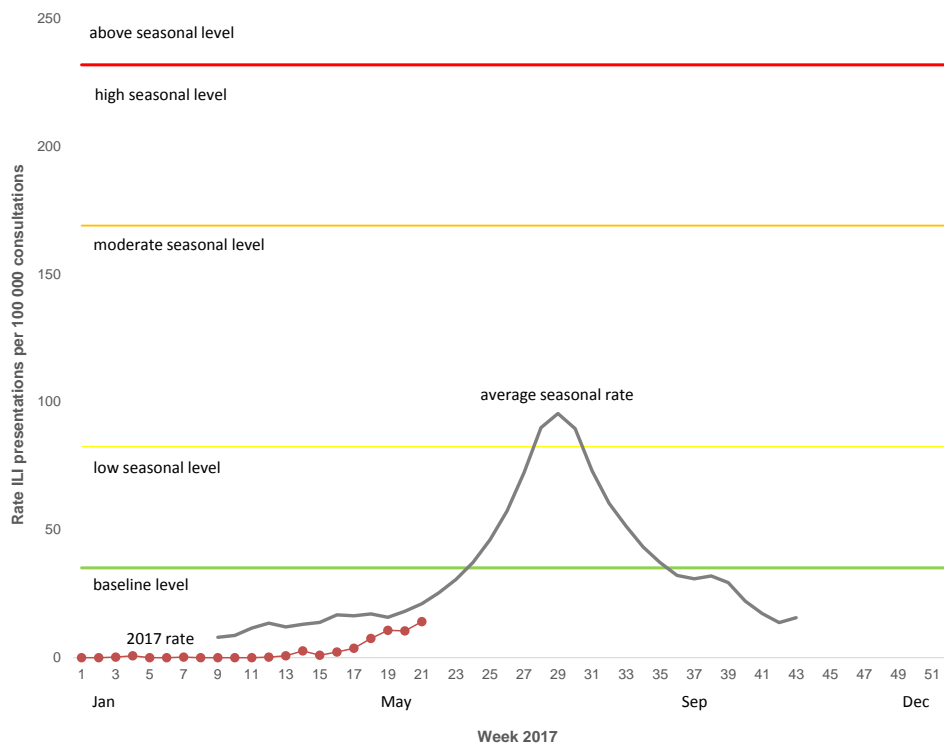


Figure 2. Comparison of 2017 rate with average seasonal rate, and historical thresholds



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

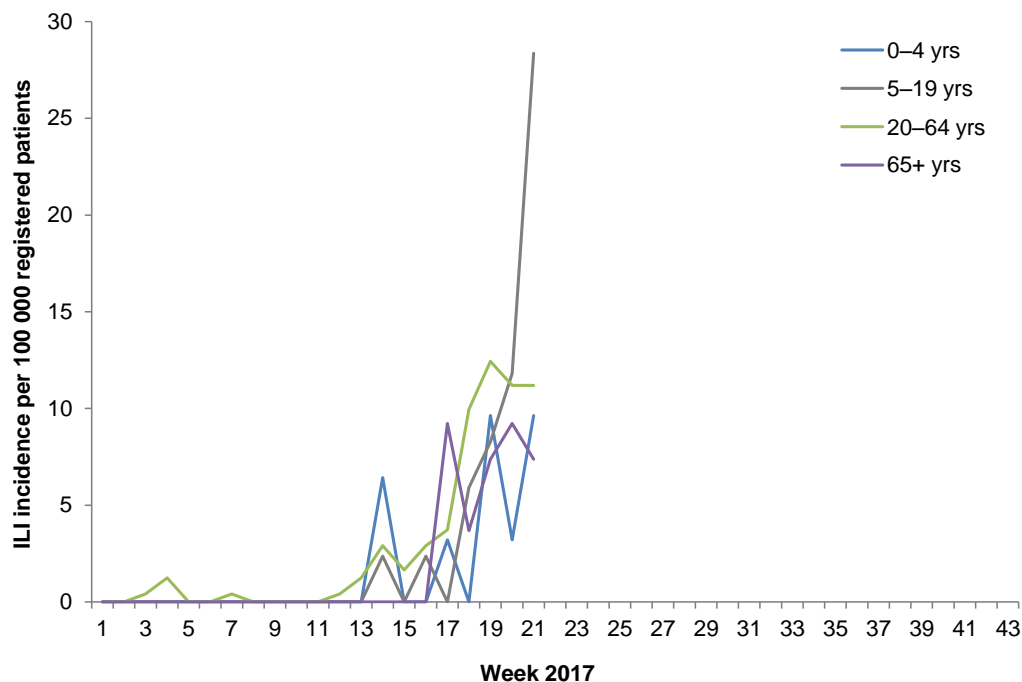


Figure 4. Weekly ILI incidence by ethnicity since 2 January 2017

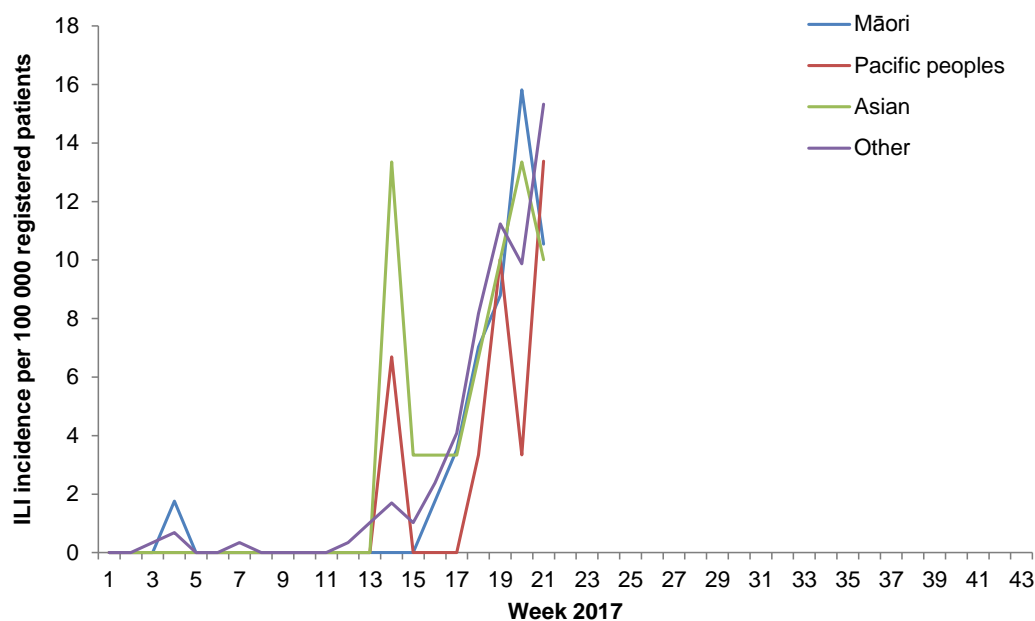
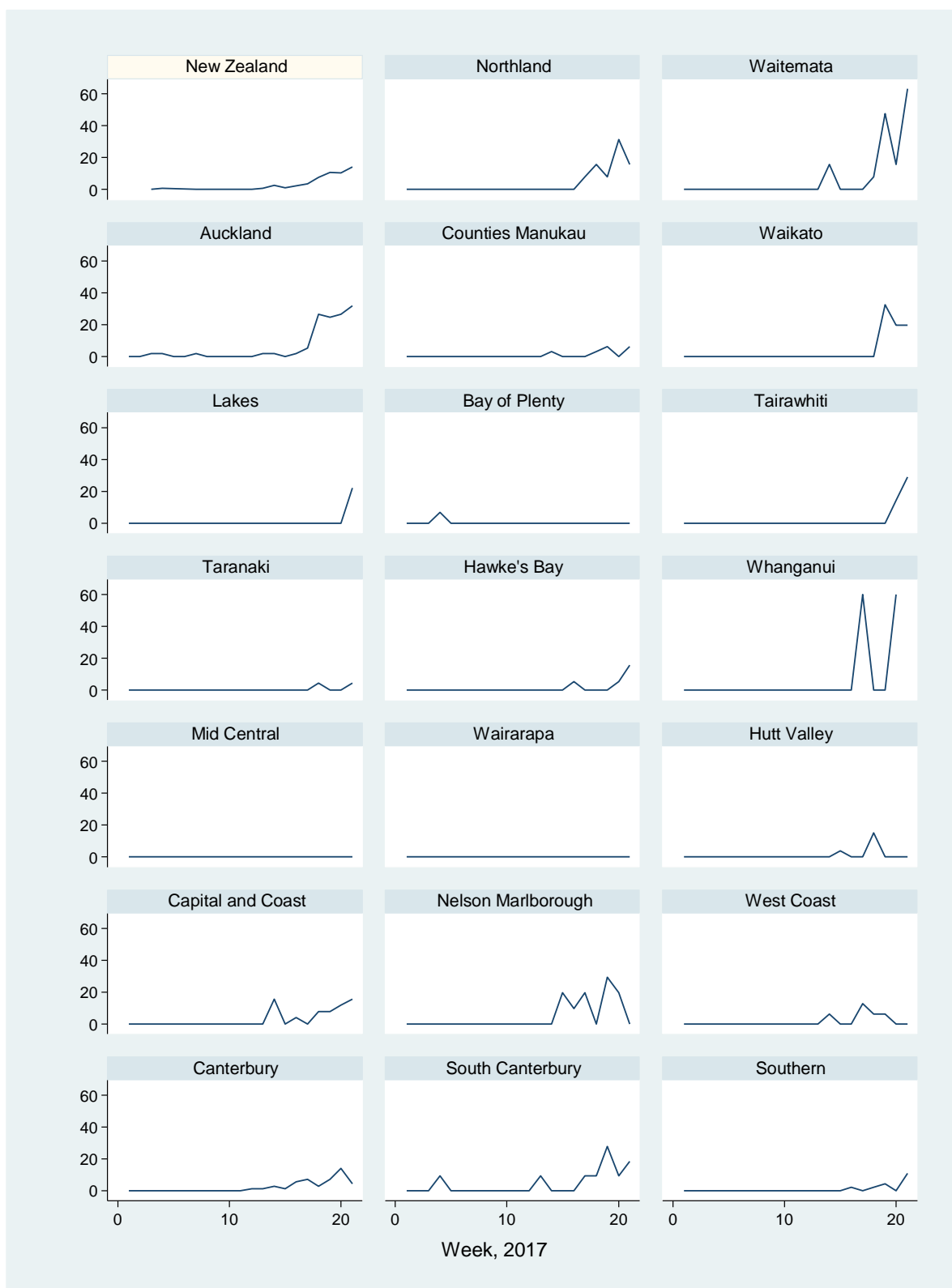


Figure 5 compares the consultation rates for influenza-like illness for each DHB over the past week. Whanganui (241.0 per 100 000, 4 cases), Waitemata (63.3 per 100 000, 8 cases), and Auckland (31.7 per 100 000, 18 cases) DHBs had the highest consultation rates.

Figure 5. Rate of ILI consultations per 100 000 registered by DHB per week since 2 January 2017



*Whanganui week 21 omitted.

Since 2 January 2017, a total of 224 ILI cases were identified. This gives a cumulative ILI incidence of 54.5 per 100 000 patient population (Table 1). Among the 135 tested ILI cases, 31 (23.0%) were positive for influenza viruses. This gives an ILI related influenza incidence of 12.5 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 ¹ (%)	ILI incidence (per 100 000)	Influenza incidence ² (per 100 000)
Overall	224	31	23.0 (100.0)	54.5	12.5
Age group (years)					
<1	3	0	(0.0)	45.4	
1–4	7	0	0.0 (0.0)	28.6	0.0
5–19	50	7	28.0 (22.6)	59.1	16.5
20–34	37	4	16.7 (12.9)	43.1	7.2
35–49	70	11	25.0 (35.5)	85.4	21.3
50–64	37	4	17.4 (12.9)	50.5	8.8
65–79	16	4	40.0 (12.9)	39.2	15.7
>80	4	1	33.3 (3.2)	29.9	10.0
Unknown	0	0	0.0		
Ethnicity					
Māori	28	3	18.8 (9.7)	49.2	9.2
Pacific peoples	11	2	28.6 (6.5)	36.8	10.5
Asian	19	3	23.1 (9.7)	63.4	14.6
European and Other	166	23	23.2 (74.2)	56.5	13.1
Unknown	0	0	0.0	0.0	
Sex					
Female	120	18	25.4 (58.1)	56.2	14.3
Male	103	13	20.3 (41.9)	52.1	10.6
Unknown	1	0	0.0		

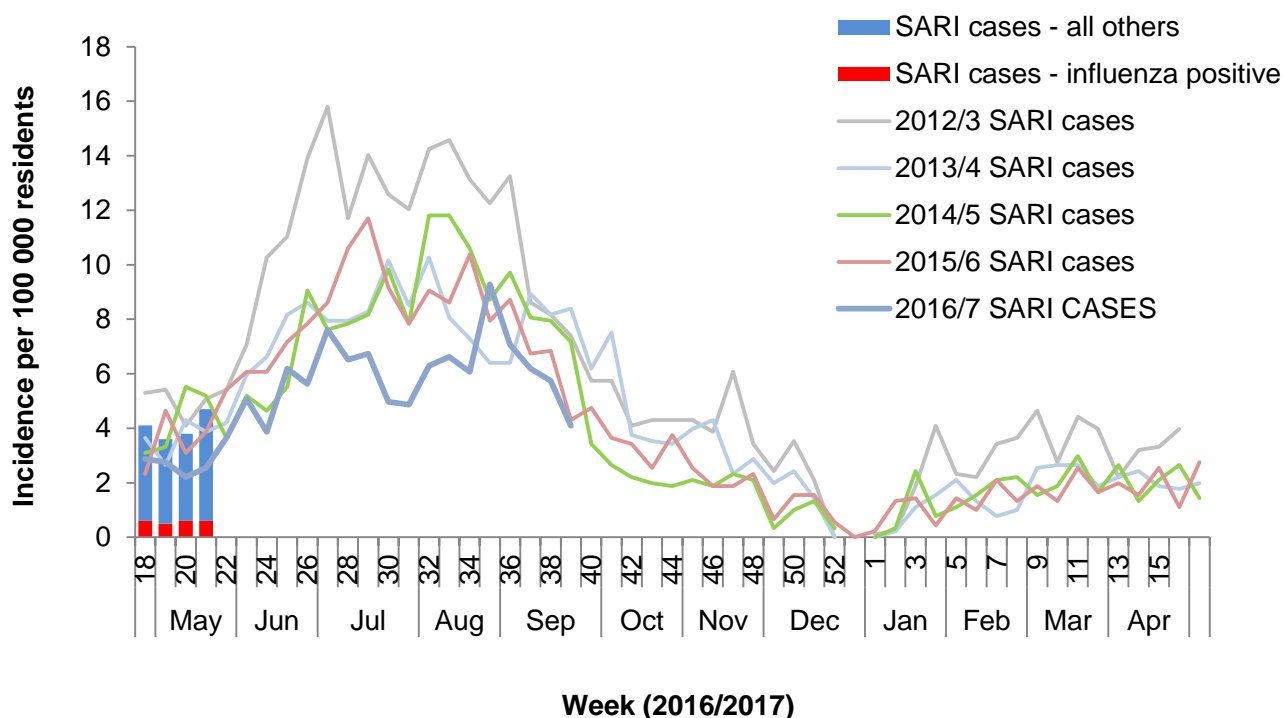
¹Proportion of cases tested which were positive for influenza viruses

²Adjusted to positivity of tested cases

Severe acute respiratory illness (SARI)

There were 2746 acute admissions to ADHB and CMDHB hospitals during week 21, ending 28 May 2017. A total of 113 patients with acute respiratory illness were assessed in these hospitals. Of these, 54 (47.8%) patients met the SARI case definition. Three cases were admitted to ICU and no SARI related deaths were reported 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 188 SARI cases were identified. This gives a SARI proportion of 16.8 per 1000 acute hospitalisations (Table 2). Twelve SARI cases have been admitted to ICU and no related deaths were reported during this period.

Of the 188 SARI cases, 147 were ADHB and CMDHB residents, giving a SARI incidence of 16.2 per 100 000 population (Table 2). Among the 132 tested SARI cases who were ADHB and CMDHB residents, 18 (13.6%) had positive influenza virus results. This gives a SARI (adjusted) related influenza incidence of 2.2 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 ¹ (%)	SARI cases	SARI incidence (per 100 000)	Influenza Cases	Influenza incidence (per 100 000)
Overall	11214	383	188 (49.1)	16.8	23 (15.4)	147	16.2	18	2.2
Age group (years)									
<1	296		27	91.2	2 (7.7)	24	177.7	2	15.5
1–4	699		20	28.6	1 (5.6)	17	32.1	1	2.1
5–19	1467		17	11.6	2 (13.3)	14	7.3	1	0.6
20–34	2164		10	4.6	0 (0.0)	10	4.8	0	0.0
35–49	1714		18	10.5	3 (20.0)	16	8.4	3	1.9
50–64	1973		24	12.2	4 (20.0)	24	15.9	4	3.2
65–79	1747		28	16.0	7 (28.0)	24	32.8	4	6.3
>80	1154		20	17.3	4 (20.0)	18	76.8	3	12.8
Unknown	0		24			0		0	
Ethnicity									
Māori	1532		36	23.5	3 (10.0)	30	30.2	2	2.5
Pacific peoples	2324		60	25.8	9 (16.4)	56	40.6	7	5.6
Asian	1864		11	5.9	0 (0.0)	11	5.2	0	0.0
European and Other	5414		57	10.5	11 (20.0)	50	12.5	9	2.3
Unknown	76		24	315.8		0		0	
Hospitals									
ADHB	6766	90	79 (87.8)	11.7	7 (13.5)	44	10.1	3	0.8
CMDHB	4448	293	109 (37.2)	24.5	16 (16.5)	103	21.9	15	3.5
Sex									
Female	5880		89	15.1	13 (15.9)	78	16.8	11	2.6
Male	5333		74	13.9	9 (13.6)	68	15.4	6	1.5
Unknown	1		25			1		1	

¹Proportion 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

Since 1 May 2017, 119 ILI specimens were tested, 31 (26.1%) were positive for influenza with the following viruses. In addition, 173 SARI specimens were tested, 29 (16.8%) were positive for influenza viruses (see Table 3).

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

Influenza viruses	ILI	SARI	SARI and non-SARI	
	Cases (%)	Cases (%)	ICU (%)	Deaths (%)
No. of specimens tested	119	173	32	2
No. of positive specimens (%) ¹	31 (26.1)	29 (16.8)	1 (3.1)	0 (0.0)
Influenza A	14	18	1	0
A (not subtyped)	2	4	1	0
A(H1N1)pdm09	3	2	0	0
A(H1N1)pdm09 by PCR	1	2	0	0
A/California/7/2009 (H1N1)pdm09 - like	2	0	0	0
A(H3N2)	9	12	0	0
A(H3N2) by PCR	9	12	0	0
A/Hong Kong/4801/2014 (H3N2) - like	0	0	0	0
Influenza B	17	11	0	0
B (lineage not determined)	1	6	0	0
B/Yamagata lineage	16	5	0	0
B/Yamagata lineage by PCR	8	3	0	0
B/Phuket/3073/2013 - like	8	2	0	0
B/Victoria lineage	0	0	0	0
B/Victoria lineage by PCR	0	0	0	0
B/Brisbane/60/2008 - like	0	0	0	0
Influenza and non-influenza co-detection (% +ve)	0 (0.0)	0 (0.0)	0 (0.0)	0 (-)

¹Number 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)

Non-influenza respiratory pathogens

Since 1 May 2017, 117 ILI specimens were tested for non-influenza viruses, 29 (24.8%) were positive with the following viruses. One hundred and three SARI specimens were tested for non-influenza viruses, 36 (35.0%) were positive with the following viruses (see Table 4).

Table 4. Non-influenza viruses among ILI and SARI cases since 1 May 2017¹

<i>Non-influenza respiratory viruses</i>	ILI	SARI	SARI and non-SARI	
	Cases (%)	Cases (%)	ICU (%)	Deaths (%)
No. of specimens tested	117	103	15	0
No. of positive specimens (%) ¹	29 (24.8)	36 (35.0)	9 (60.0)	0 (-)
Respiratory syncytial virus (RSV)	4	13	2	0
Parainfluenza 1 (PIV1)	0	0	0	0
Parainfluenza 2 (PIV2)	3	2	0	0
Parainfluenza 3 (PIV3)	0	2	0	0
Rhinovirus (RV)	18	19	7	0
Adenovirus (AdV)	2	2	0	0
Human metapneumovirus (hMPV)	2	4	0	0
Enterovirus	2	1	0	0
Single virus detection (% of positives)	29 (100.0)	30 (83.3)	9 (100.0)	0 (-)
Multiple virus detection (% of positives)	1 (3.4)	6 (16.7)	0 (0.0)	0 (-)

¹Number 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 week¹

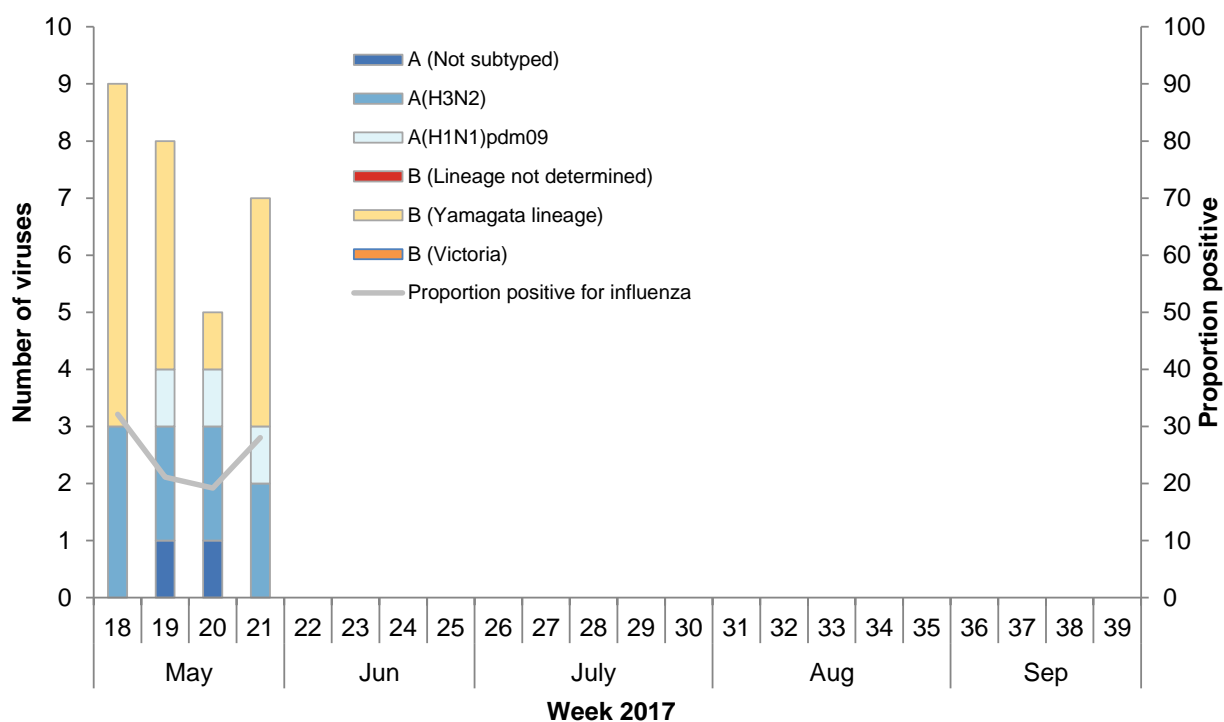


Figure 8. Temporal distribution of the number and proportion of influenza viruses from SARI specimens by type and week¹

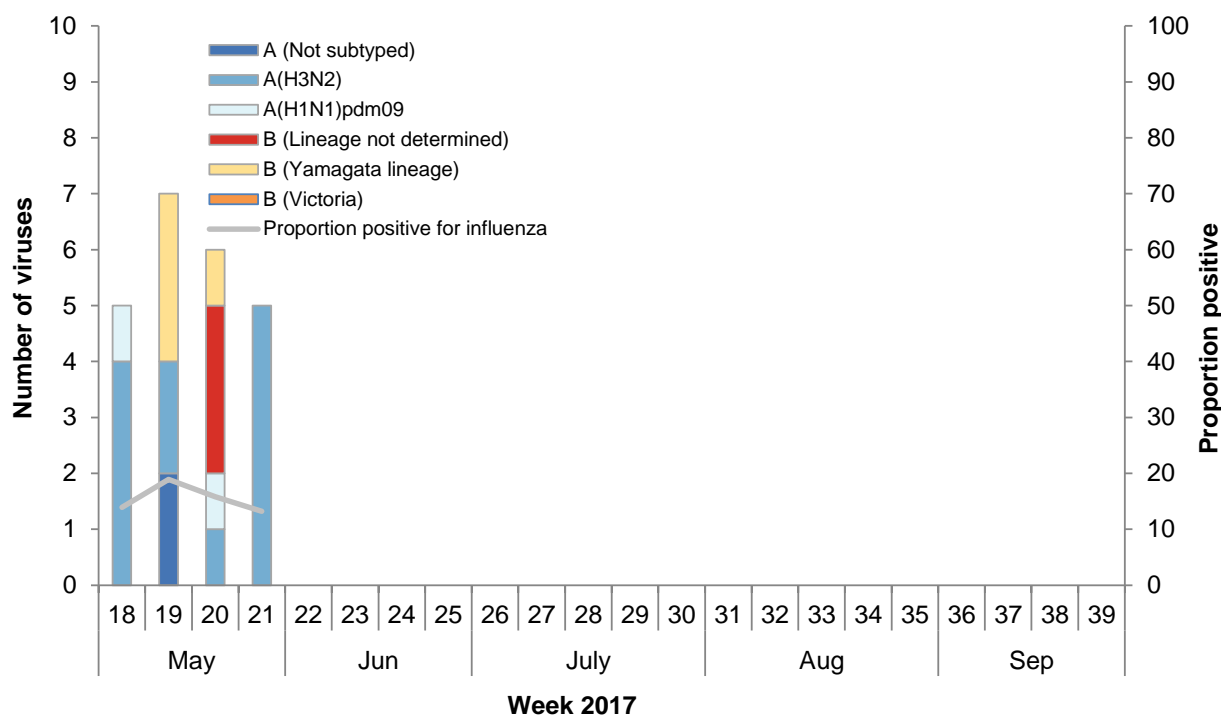


Figure 9. Temporal distribution of the number and proportion of non-influenza viruses from ILI specimens by type and week¹

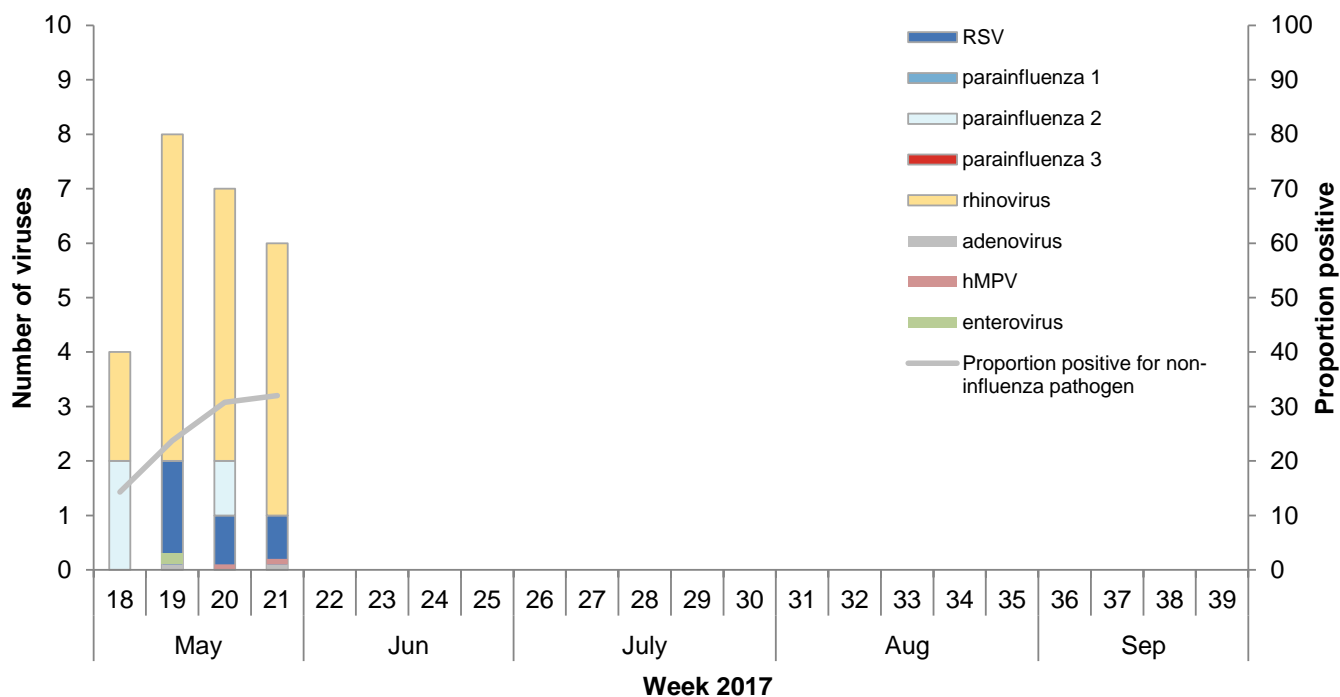
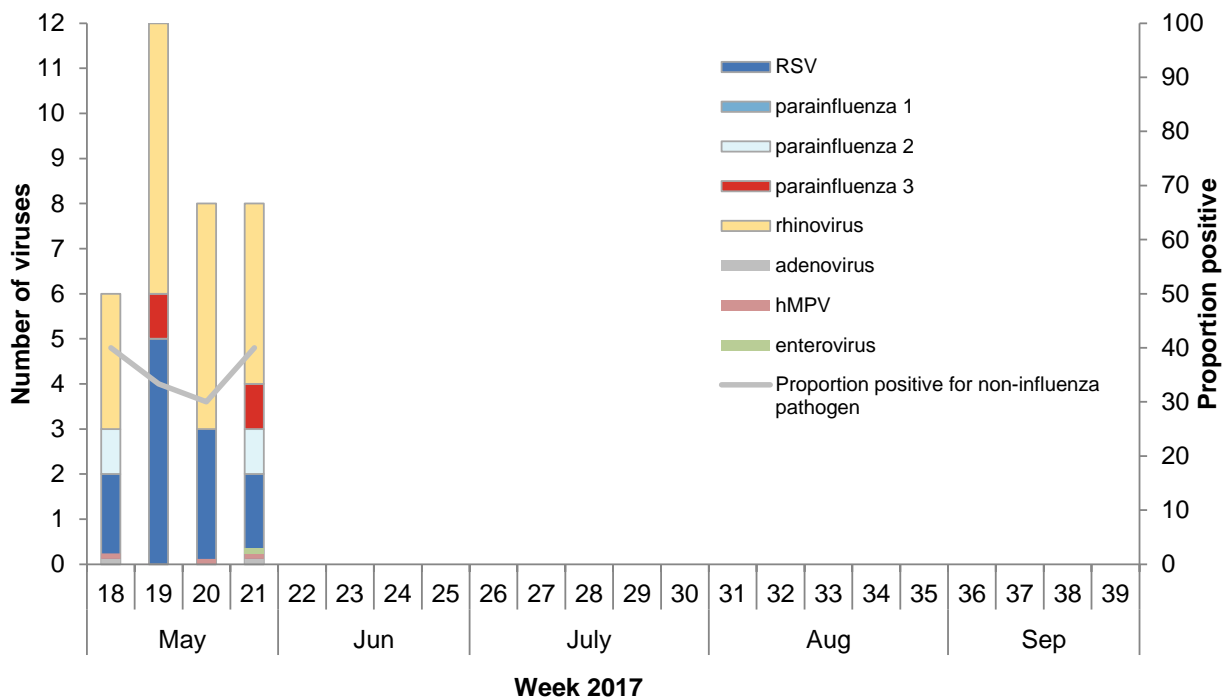


Figure 10. Temporal distribution of the number and proportion of non-influenza viruses from SARI specimens by type and week¹



¹Figures 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 1–21, 2017

DHB	Week																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Auckland	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	1	3	15	14	15	18
Bay of Plenty	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canterbury	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	4	5	2	5	10	3
Capital and Coast	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	2	2	3	4
Counties Manukau	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	2
Hawke's Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
Hutt Valley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	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
MidCentral	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	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	3	2	0
Northland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	4	2
South Canterbury	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	3	1	2
Southern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	5
Tairāwhiti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Taranaki	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Waikato	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	3
Wairarapa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waitemata	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	6	2	8
West Coast	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	1	0	0
Whanganui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4
New Zealand	0	0	1	3	0	0	1	0	0	0	0	1	3	11	4	9	15	31	44	43	58

Table 6. Influenza-like illness rate by DHB by week 1–21, 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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
Waitemata	0.0	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
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
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
New Zealand	0.0	0.0	0.2	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.7	2.7	1.0	2.2	3.6	7.5	10.7	10.5	14.1



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).

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 75 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);
- 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).

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