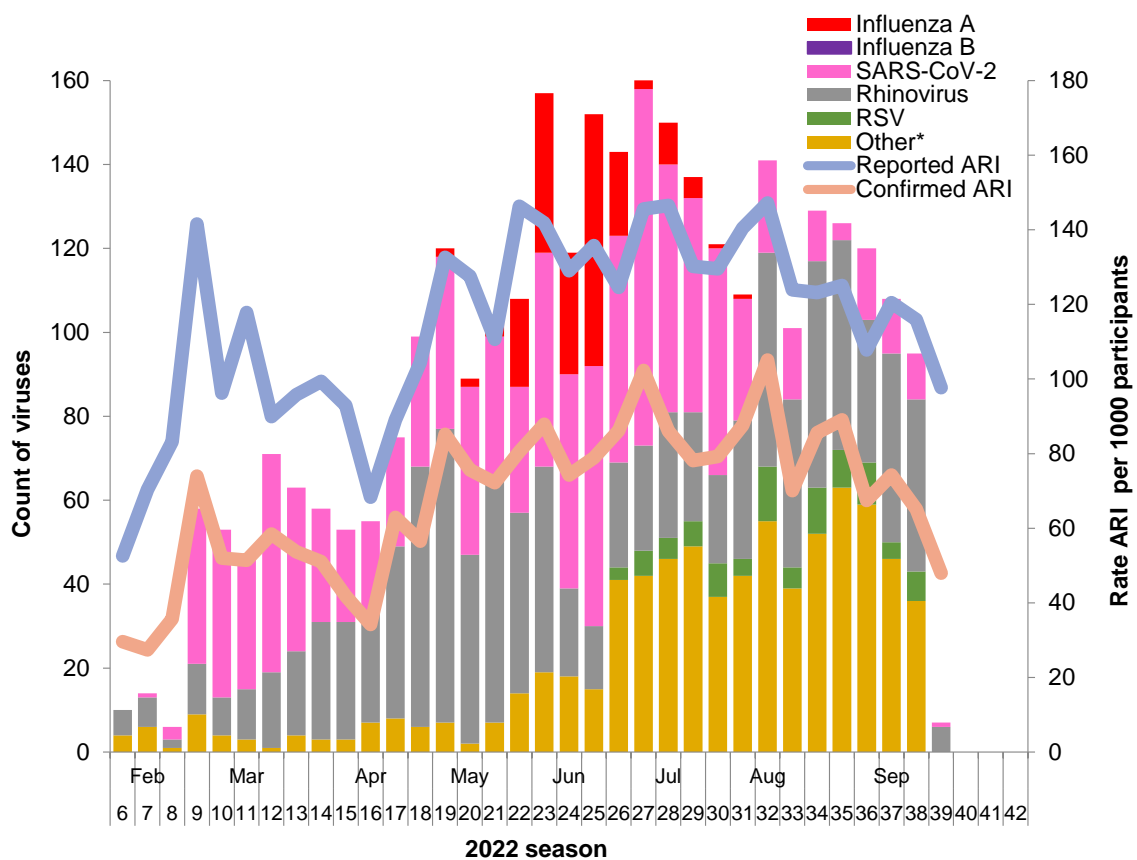


WellKiwis weekly report on influenza-like illness and associated viruses

Week 39 ending 2 October, 2022

The surveillance for community cohort-based influenza-like illness (ILI) provides evidence to inform public health and clinical practice to reduce the impact of influenza virus infection and other important respiratory pathogens such as SARS-CoV-2 (causing COVID-19 infection). As part of the WellKiwis influenza study, this weekly report summarises data obtained from the WellKiwis cohorts in Wellington. The report includes incidence and viruses for community cohort ILI cases for the past week as well as the cumulative period since 7 February 2022.

Figure 1 show the weekly rate of influenza like illness (ILI) and associated viruses detected among the WellKiwis cohort participants during the study period.

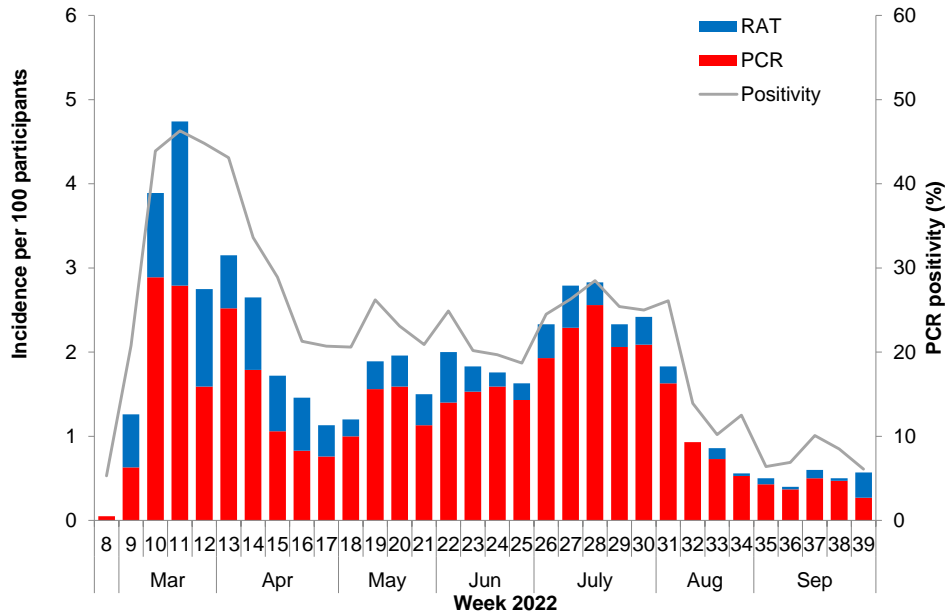


Note: other viruses include enterovirus, adenovirus, parainfluenza virus types 1-3 and human metapneumovirus. The left axis indicates number of respiratory viruses detected among participants each week. The different coloured bars on the graph represent the count of the different respiratory viruses detected. The right axis shows weekly ILI rates - the blue line is the weekly rate of ILI reported by participants (per 1000), and the orange line the rate of nurse-confirmed ILI meeting the case definition. (Note: The case definition¹ in 2020-2022 has been widened compared to previous years, 2018-2019. This is to increase the sensitivity to detecting influenza as well as SARS-CoV-2 that causes COVID-19 infection). X-axis is based on the date of symptom onset.

The case definition in 2020–22: acute respiratory illness with fever or feverishness and/or one of following symptoms (cough, running nose, wheezing, sore throat, shortness of breath, loss of sense of smell/taste) with onset in the past 10 days). And a clinician's judgement that the illness is due to an infection. The case definition in 2018 and 2019: acute respiratory illness with cough and fever/measured fever of $\geq 38^{\circ}\text{C}$ and onset within the past 10 days).

The WellKiwis cohort is an excellent platform to understand incidence, risk factors and household transmission caused by the Omicron variant of COVID-19 in our community.

Figure 2 shows weekly incidence rate of PCR-confirmed and/or RAT positive COVID-19 cases among the WellKiwis cohort participants during the study period.



*Note: X-axis is based on the date of test reporting of COVID-19 positive cases

Characteristics	ARI cases among WellKiwis participants		COVID-19 cases among WellKiwis participants	
	ARI Cases	ARI incidence (per 100)	COVID-19 Cases	COVID-19 incidence (per 100)
Overall	5727	209.4 (204.2, 214.7)	1576	54.2 (51.6, 57.0)
Age group (years)				
<1	987	313.7 (295.3, 332.9)	148	44.3 (37.5, 52.0)
1-4	1211	614.2 (583.1, 646.2)	158	75.4 (64.2, 88.0)
5-19	675	194.0 (180.0, 208.7)	245	66.3 (58.3, 75.0)
20-34	832	241.3 (225.7, 257.6)	204	55.7 (48.4, 63.8)
35-49	1346	206.4 (195.8, 217.3)	443	63.9 (58.2, 70.1)
50-64	500	97.2 (89.0, 106.0)	281	51.4 (45.6, 57.8)
≥65	175	77.1 (66.2, 89.2)	97	40.2 (32.7, 49.0)
Unknown	1	-	0	-
Ethnicity				
Māori	646	270.3 (250.6, 291.0)	144	56.7 (47.9, 66.7)
Pacific peoples	198	253.7 (220.6, 289.9)	50	60.3 (44.8, 79.2)
Asian	389	192.6 (174.4, 212.1)	102	47.5 (38.8, 57.6)
European and Other	4490	216.0 (209.9, 222.2)	1280	57.9 (54.8, 61.2)
Unknown	4	-	0	-
Sex				
Female	3278	216.3 (209.1, 223.5)	909	56.4 (52.9, 60.2)
Male	2435	225.0 (216.5, 233.8)	665	57.8 (53.6, 62.4)
Unknown	14	-	2	-

Note: COVID cases include those participants with self-reported RAT positive, those with PCR-confirmed acute respiratory illness, and those participating in the household transmission study from whom any swab was PCR-confirmed.)

Tables 1 and 2 below indicate all swabs tested for SARS-Cov-2 and influenza and other non-influenza respiratory viruses from week 6 (starting 7 February) to this week.

Table 1 Non-influenza respiratory viruses among ILI cases, since 7 February 2022

<i>Non-influenza respiratory viruses</i>	WellKiwis Households	Wellkiwis Infants	WellKiwis Adults	Total
No. of specimens tested	2532	1308	1001	4841
No. of positive specimens (%) ¹	1195 (47.2)	919 (70.3)	528 (52.7)	2642 (54.6)
Respiratory syncytial virus (RSV)	37	52	2	91
Parainfluenza 1 (PIV1)	3	0	0	3
Parainfluenza 2 (PIV2)	8	0	0	8
Parainfluenza 3 (PIV3)	66	97	9	172
Rhinovirus (RV)	480	507	66	1053
Adenovirus (AdV)	53	110	6	169
Human metapneumovirus (hMPV)	100	80	18	198
Enterovirus	37	69	4	110
SARS-CoV-2	493	143	433	1069
Single virus detection (% of positives)	1116 (93.4)	791 (86.1)	519 (98.3)	2426 (91.8)
Multiple virus detection (% of positives)	79 (6.6)	128 (13.9)	9 (1.7)	216 (8.2)

Note: The PCR positive cases only include those participants with acute respiratory illnesses.

Table 2 Influenza respiratory viruses among ILI cases, since 7 February 2022

<i>Influenza viruses</i>	WellKiwis Households	Wellkiwis Infants	WellKiwis Adults	Total
No. of specimens tested	2581	1314	1005	4900
No. of positive specimens (%) ¹	154 (6.0)	56 (4.3)	11 (1.1)	221 (4.5)
Influenza A	154	56	11	221
A (not subtyped)	6	2	4	12
A(H1N1)pdm09	2	0	0	2
A(H1N1)pdm09 by PCR	2	0	0	2
A/Victoria/2570/2019 (H1N1)pdm09 - like	0	0	0	0
A(H3N2)	146	54	7	207
A(H3N2) by PCR	145	54	7	206
A/Darwin/9/2021 (H3N2)-like virus	1	0	0	1
Influenza B	0	0	0	0
B (lineage not determined)	0	0	0	0
B/Yamagata lineage	0	0	0	0
B/Yamagata lineage by PCR	0	0	0	0
B/Phuket/3073/2013 - like	0	0	0	0
B/Victoria lineage	0	0	0	0
B/Victoria lineage by PCR	0	0	0	0
B/Austria/1359417/2021-like virus	0	0	0	0
Influenza and non-influenza co-detection (% +ve)	1 (0.6)	0 (0.0)	0 (0.0)	1 (0.5)

¹ Positive specimens may be positive for more than one virus

APPENDIX

The WellKiwis influenza study is funded by the US National Institutes of Allergy and Infectious Diseases (NIAID) (HHSN272201400006C and U01 AI 144616) through the St Jude Children's Research Hospital, Memphis, Tennessee. The study aims to understand how an adult's prior (or a child's first) flu exposure influences immunity to subsequent flu exposures with the ultimate goal of developing a longer-lasting and broad-protective universal influenza vaccine.

The WellKiwis adult cohort (i.e. SHIVERS-II) follows a group of ~2000 Wellington adults aged 20-72 years. It was established in Wellington in 2018 and is ongoing till 2022. It focuses on adults' immune responses to the flu and flu vaccinations. The study follows participants who provide one annual blood sample each year. During the influenza surveillance period (May-September), the study follows participants weekly and collects respiratory specimens from those who report influenza-like illness (ILI). These specimens are then tested for influenza, SARS-CoV-2 and non-influenza respiratory viruses. Additional samples (blood or swab) are needed only if the child has a flu or COVID-19 infection or vaccination.

The WellKiwis infant cohort (i.e SHIVERS-III) is a study about influenza immunity in children. The study is to follow new-borns over seven years to see how a child's first encounter to the flu virus or vaccine shapes their immune responses to subsequent exposures to flu as the child grows between 2019 and 2026. The aim is to enrol 600 wellington mother-infant pairs (200 pairs a year for three years). Once enrolled, study staff monitor the child's flu-like illness during the winter period through regular surveys and ILI swab collection and testing. A cord blood is needed and one annual blood from the child each year. Additional samples (blood or swab) are needed only if the child has a flu or COVID-19 infection or vaccination.

The WellKiwis household cohort (i.e SHIVERS-IV) study follows ~450 families for up to seven years (2021-2028). In addition to understand how their prior flu exposures shape their immunity to subsequent flu exposures, it also aims to understand how the flu virus spreads from an infected person to others in a household setting. Once enrolled, study staff monitor the household's flu-like illness during the winter period through regular surveys and ILI swab collection and testing. A once-only baseline blood is needed and one annual blood from each household member each year. Additional samples (blood or swab) are needed only if a household member has a flu or COVID-19 infection or vaccination.

The WellKiwis study is the second, third and fourth iterations of research programmes into influenza viruses and vaccines called SHIVERS (Southern Hemisphere Influenza and Vaccine Effectiveness Research and Surveillance). ESR has a long history of influenza research and led the SHIVERS-I study during 2012-2017 through the funding from the US Centre for Disease Control.

Led by ESR, WellKiwis is a multi-centre and multi-disciplinary collaboration between ESR, Hutt Valley District Health Board, Regional Public Health, Capital Coast District Health Board, University of Otago, University of Auckland, Malaghan Institute of Medical Research, participating general practices, Primary Health Organisations, Wellington Maternity Health Professionals and St Jude Children's Hospital in Memphis, USA.

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