

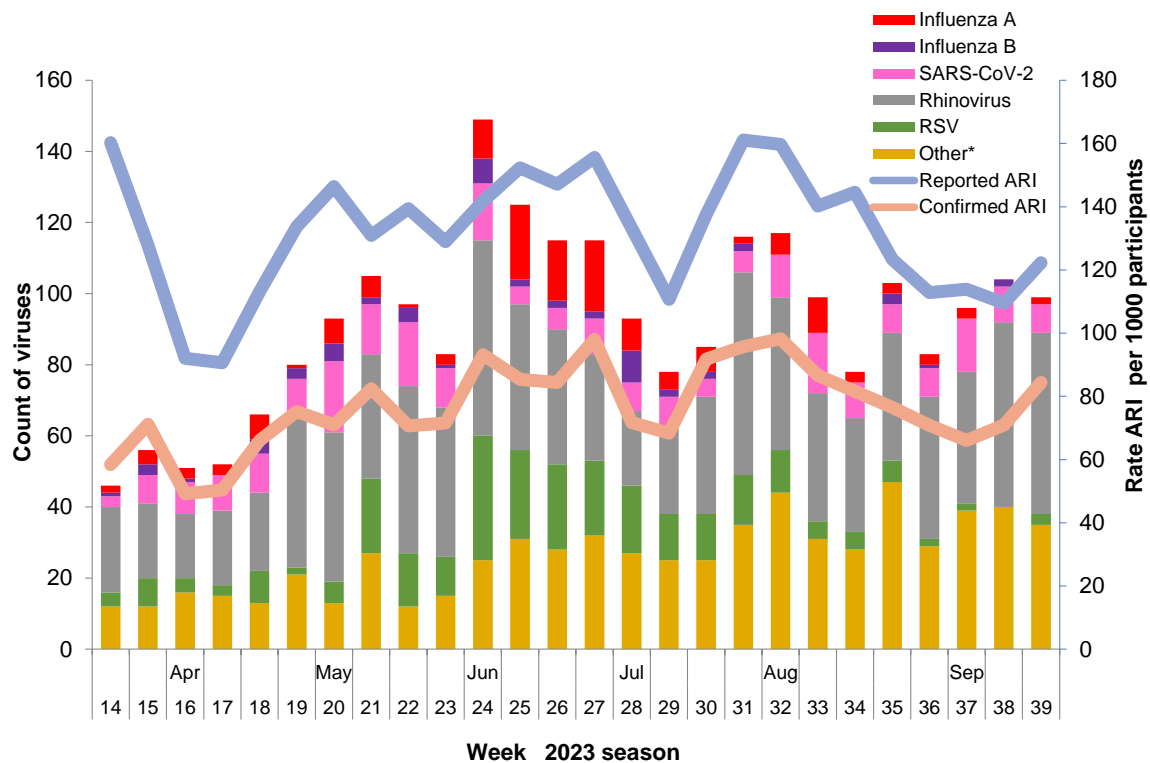


WellKiwis weekly report on influenza-like illness and associated viruses

Week 39 ending 1 October 2023

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 3 April.

Figure 1 shows 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 2020–2023 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 2020–23: 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 influenza in our community.

Tables 1 and 2 below indicate all swabs tested for influenza and other non-influenza respiratory viruses from week 14 (starting 3 April) to this week.

Table 1. Non-influenza respiratory viruses among ILI cases, since 3 April 2023

<i>Non-influenza respiratory viruses</i>	WellKiwis Households	Wellkiwis Infants	WellKiwis Adults	Total
No. of specimens tested	2748	821	330	3899
No. of positive specimens (%) ¹	1171 (42.6)	565 (68.8)	150 (45.5)	1886 (48.4)
Respiratory syncytial virus (RSV)	177	90	15	282
Parainfluenza 1 (PIV1)	23	12	1	36
Parainfluenza 2 (PIV2)	10	2	0	12
Parainfluenza 3 (PIV3)	58	51	3	112
Rhinovirus (RV)	579	301	62	942
Adenovirus (AdV)	119	112	4	235
Human metapneumovirus (hMPV)	104	39	14	157
Enterovirus	57	67	1	125
SARS-CoV-2	183	28	55	266
Single virus detection (% of positives)	1039 (88.7)	436 (77.2)	146 (97.3)	1621 (85.9)
Multiple virus detection (% of positives)	132 (11.3)	129 (22.8)	4 (2.7)	265 (14.1)

¹ Positive specimens may be positive for more than one virus

Table 2. Influenza respiratory viruses among ILI cases, since 3 April 2023

<i>Influenza viruses</i>	WellKiwis Households	Wellkiwis Infants	WellKiwis Adults	Total
No. of specimens tested	2756	827	332	3915
No. of positive specimens (%) ¹	160 (5.8)	36 (4.4)	21 (6.3)	217 (5.5)
Influenza A	112	29	18	159
A (not subtyped)	8	3	1	12
A(H1N1)pdm09	98	25	15	138
A(H1N1)pdm09 by PCR	98	25	15	138
A/Sydney/5/2021 (H1N1)pdm09 - like	0	0	0	0
A(H3N2)	6	1	2	9
A(H3N2) by PCR	6	1	2	9
A/Darwin/6/2021 (H3N2)-like	0	0	0	0
Influenza B	48	7	3	58
B (lineage not determined)	1	0	0	1
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	47	7	3	57
B/Victoria lineage by PCR	47	7	3	57
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

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



Table 3. Demographic status of ARI and influenza infection

Characteristics	ARI cases among WellKiwis participants		Influenza cases among WellKiwis participants	
	ARI Cases	ARI incidence (per 100)	Influenza Cases	Influenza incidence (per 100)
Overall	5100	161.9 (157.6, 166.3)	217	6.9 (6.0, 7.9)
Age group (years)				
<1	833	297.5 (278.7, 317.1)	26	9.3 (6.1, 13.6)
1–4	1583	266.1 (253.7, 278.7)	65	10.9 (8.4, 13.9)
5–19	573	134.5 (124.0, 145.7)	58	13.6 (10.3, 17.6)
20–34	619	188.1 (174.1, 203.0)	11	3.3 (1.7, 6.0)
35–49	1094	149.7 (141.2, 158.5)	40	5.5 (3.9, 7.4)
50–64	283	53.2 (47.2, 59.7)	14	2.6 (1.4, 4.4)
≥65	115	44.7 (37.0, 53.6)	3	1.2 (0.2, 3.4)
Unknown	0	-	0	-
Ethnicity				
Māori	549	164.4 (151.3, 178.2)	16	4.8 (2.7, 7.8)
Pacific peoples	217	180.8 (158.3, 205.5)	10	8.3 (4.0, 15.3)
Asian	434	164.4 (149.7, 180.0)	30	11.4 (7.7, 16.2)
European and Other	3900	160.4 (155.5, 165.3)	161	6.6 (5.6, 7.7)
Unknown	0	-	0	-
Sex				
Female	2939	164.4 (158.7, 170.2)	122	6.8 (5.7, 8.1)
Male	2148	158.3 (151.9, 164.9)	94	6.9 (5.6, 8.5)
Unknown	13	-	1	-

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 2024. 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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