Science for Communities
He Pūtaiao, He Tāngata

2023 ACUTE RESPIRATORY ILLNESS SURVEILLANCE REPORT

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CLIENT REPORT No: FW24007

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Client Report FW24007

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Disclaimer

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EXECUTIVE SUMMARY

ESR conducts surveillance of viral respiratory illness in New Zealand to support public health planning, policy-related activities and to inform clinical practice, all with the aim of reducing the respiratory disease burden. This report provides a summary of priority viral respiratory illness in New Zealand in 2023[1], including influenza, respiratory syncytial virus (RSV) and COVID-19. Although COVID-19 is a notifiable disease, most viral respiratory illnesses are not legally notifiable in New Zealand.

There are references to influenza-like illness (ILI) and severe acute respiratory infection (SARI) in different sections of this report. New Zealand surveillance systems use the World Health Organisation (WHO) definitions for ILI[2] and SARI[3], unless otherwise stated in the text.

The COVID-19 pandemic has had significant impacts on respiratory disease dynamics and acute respiratory illness (ARI) surveillance systems, this should be taken into consideration when interpreting these data and making comparisons to pre-pandemic years. Most of the annual trend data presented in tables and figures in this report exclude the pandemic years (2020 and 2021). This report includes less emphasis on COVID-19, so as to refocus on the broader viral respiratory illness environment.

The main findings from this report include the following:

- Overall, information from the surveillance system suggests 2023 was a moderate year for ILI.
- Most ILI indicators showed four periods of elevated activity in 2023, with at least two peaks in illness. Some of the indicators had peaks between March and April, with the first surge in activity, while other indicators peaked around the beginning of July during the second wave of illness, and/or again in mid-September with the third wave. Each of the first three waves were driven primarily by influenza, boosted by other respiratory viruses. There was a small, but sustained surge in activity at the end of 2023, fuelled in part by an increase in SARS-CoV-2.
- Lab-based surveillance showed that influenza A(H1N1) and influenza B/Victoria were the two main influenza subtypes co-circulating throughout 2023 (Institute of Environmental Science and Research, 2024).
- FluTracking survey data show a decrease in general practitioner (GP) consultation rates for adults with ILI symptoms, between 2018 and 2023. Survey data also indicate that about three quarters of adults with ILI symptoms take time off work, or normal duties each week because of their symptoms.
- Hospital-based surveillance in the Auckland region showed that severe acute respiratory infection (SARI) (any cause) admissions were at low levels in 2023, with four waves and two peaks in SARI rates. Those under 5 years and those 65 years or older had the highest rates of SARI hospitalisation. Pacific peoples were hospitalised for SARI at greater rates than people of other ethnicities.
- The virology of hospital-based SARI also showed four waves of activity in 2023, with the first three waves driven primarily by influenza and the fourth wave in the latter quarter of 2023 driven by SARS-CoV-2 and rhinovirus. Among the 487 influenza-positive specimens from SARI patients, 343 (70.4%) were influenza A in 2023 (Institute of Environmental Science and

1. Further information about the surveillance of viral respiratory illness in New Zealand can be found here: esr.cri.nz/expertise/public-health/infectious-disease-intelligence-surveillance/#About
2. The WHO (2013) define ILI as an acute respiratory infection with measured fever ≥38 ^{o}C and cough; with onset within the last 10 days.
3. The WHO (2013) define SARI as an acute respiratory infection with a history of fever or measured fever 38 ^{o}C and cough; with onset within the last 10 days, requiring hospitalisation.

Research, 2024). Of the influenza A-positive specimens, 175 were further subtyped (51.0%), of which 165 were A(H1N1)pdm09 (94.3%) and 10 were A(H3N2) (5.7%).

- Influenza-positive SARI rates were low overall in 2023, but higher than the rates observed in 2022, with three distinct peaks in activity.
- Sustained, moderate rates of RSV were observed in SARI patients 0–4 years. Pacific peoples experienced higher SARI hospitalisation rates for SARS-CoV-2 and RSV, but their influenza-positive SARI rates were similar to 'Other' peoples. Influenza-positive rates for Māori were lower than the rates for Pacific and 'Other' peoples in 2023 and were similar to the influenza-positive rates observed for Asian peoples.
- The cumulative incidence of influenza-positive SARI hospitalisations for 2023 was between the cumulative incidence for 2018 and 2019, which were moderately severe seasons. Relative to pre-pandemic years, the severity of influenza illness (measured by the ratio of influenza-associated ICU SARI admissions to influenza-associated SARI hospitalisations) was lower in 2023.
- The GP ILI data yielded an influenza vaccine effectiveness (VE) estimate of 72.7% and the SARI hospital surveillance data yielded an influenza VE estimate of 61.9% for adults 19–64 years. Both estimates indicate good VE against illness in 2023.
- Most of the COVID-19 indicators, through the ESR acute respiratory surveillance system, showed low activity in 2023 when compared with 2022. There was a small surge in rates observed towards the end of 2023, due primarily to the EG.5 and HK.3 variants, and the arrival of the JN.1 variant. Please note that this surveillance generally excludes non-febrile presentations of COVID-19. More information on COVID-19 trends is published here.

NATIONAL ACUTE RESPIRATORY ILLNESS SURVEILLANCE OBJECTIVES

The overarching goal of ARI surveillance is to minimise the impact and health inequities of these illnesses, by providing useful information to public health authorities and communities, so that they may better plan appropriate health promotion, disease protection and control measures.

The specific objectives of acute respiratory illness surveillance are to:

1. Actively monitor and better understand the patterns of activity (e.g. seasonality, severity) of influenza, SARS-CoV-2 and other respiratory viruses.
2. Describe the burden of ILI and SARI-associated influenza, SARS-CoV-2 and other respiratory viruses in New Zealand, including among priority populations.
3. Describe characteristics of locally circulating influenza, SARS-CoV-2 and other respiratory viruses.
4. Inform influenza and COVID-19 vaccination policy and treatment decisions to reduce the burden of disease and support equitable outcomes.
5. Facilitate decision-making for pandemic influenza risk management, both nationally and globally.

NATIONAL ACUTE RESPIRATORY ILLNESS SURVEILLANCE SYSTEMS

ARI surveillance systems collect information that together build a picture of the burden of disease from influenza and other acute respiratory illnesses in New Zealand. They allow us to assess how well important public health protective measures, such as vaccination, are working. These surveillance systems operate in the community, primary care, hospitals and laboratories to capture disease presentations at different levels of severity and are detailed below:

HealthStat sentinel GP surveillance of ILI consultations – This system monitors the number and characteristics of people who have presented to their GP with ILI in the past week. ILI is defined by the WHO as an acute respiratory infection with a history of fever or measured fever of ≥38°C, and cough (2013). ILI consultation information is extracted from around 400 participating GP clinics nationally. SNOWMED and Read codes are used to identify ILI-related consultations, including COVID-19 and non-COVID-19 ILI consultations. More information about HealthStat is available here.

HealthLine – This system monitors the number and characteristics of people calling HealthLine (the free, national, 24-hour telephone health service) for ARI advice each week. Calls are triaged using electronic clinical decision support software. Those coded as cold/flu, cough, croup, fever, general aches, headache and/or sore throat are counted as ILI. Non-symptomatic calls (30% of HealthLine calls) are excluded.

FluTracking – This system relies on voluntary participation by the public to self-report illness in an online weekly survey. It was launched in New Zealand in 2018 and is used to monitor community-level ILI trends. In 2023, there were almost 50,000 people who completed at least one FluTracking survey, and an average of 30,300 responses were received each week. Participants are given the option to opt-out outside of the influenza season (October to April); accordingly, the sample size is smaller at this time. Those who record experiencing a fever and cough are counted as having an ILI. More information about FluTracking is available here.

Sentinel GP virological surveillance – ESR works with a network of about 90 sentinel GP clinics around the country that take a respiratory swab from a subset of patients presenting to clinics each week with ILI symptoms. These patients are tested for a range of respiratory viruses at the ESR laboratory. This system provides information on the different viruses that are circulating and causing illness in the community.

Sentinel hospital surveillance – This system monitors patients admitted to hospital overnight who meet the WHO (2014) case definition for SARI in the four public hospitals in Counties Manukau and Auckland districts. The case definition is an ARI with a history of fever or measured fever of ≥38°C, a cough, and onset within the past 10 days, requiring inpatient hospitalisation. Research nurses collect information on SARI patients in general wards and intensive care units (ICUs). Nasopharyngeal swabs are offered to patients if not already taken as part of clinical care, and they are tested for influenza and other respiratory viruses. The viruses that are tested for vary and are dependent on several factors, including clinical decision making, laboratory capacity and patient characteristics.

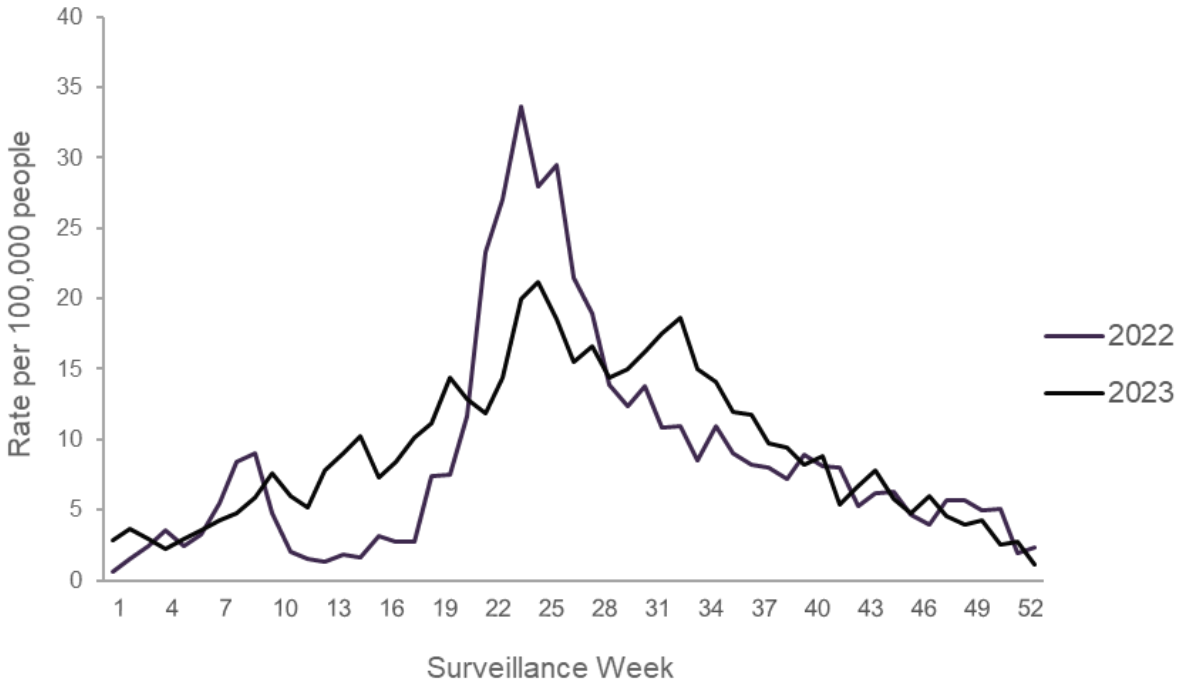
COVID-19 notifiable disease reporting – COVID-19 is a notifiable disease and reported through EpiSurv, New Zealand's notifiable disease reporting system. Since 25 February 2022, most testing has been through self-administered rapid antigen test (RAT), which requires self-reporting of results. Therefore, it is likely that many infections are not detected or reported, and case ascertainment may differ by age, ethnicity, deprivation, or other demographic factors. Case ascertainment has declined from a peak in March 2022.

COMMUNITY-BASED SURVEILLANCE

HealthStat GP ILI-related consultations

HealthStat provide ESR with ILI-related GP consultation data for surveillance purposes. There were 9,010 (non-COVID-19) ILI-related GP consultations reported in 2023, an 11% increase on the 8,115 reported in 2022. Consultation rates increased steadily from the beginning of 2023 to a peak in mid-June, with another peak in late August, before decreasing steadily to the end of the year (Figure 1). The peaks observed during the winter months correspond with surges in influenza (influenza A(H1N1)pdm09 and influenza B/Victoria strains predominant) (Institute of Environmental Science and Research, 2024), rhinovirus, enterovirus and RSV (Figure 4) detected through virological surveillance in the community.

Figure 1: Weekly HealthStat GP (non-COVID-19) ILI consultation rates



Source: HealthStat as of 28 February 2024.
Data exclude patient consultations with COVID-19-related diagnostic codes.

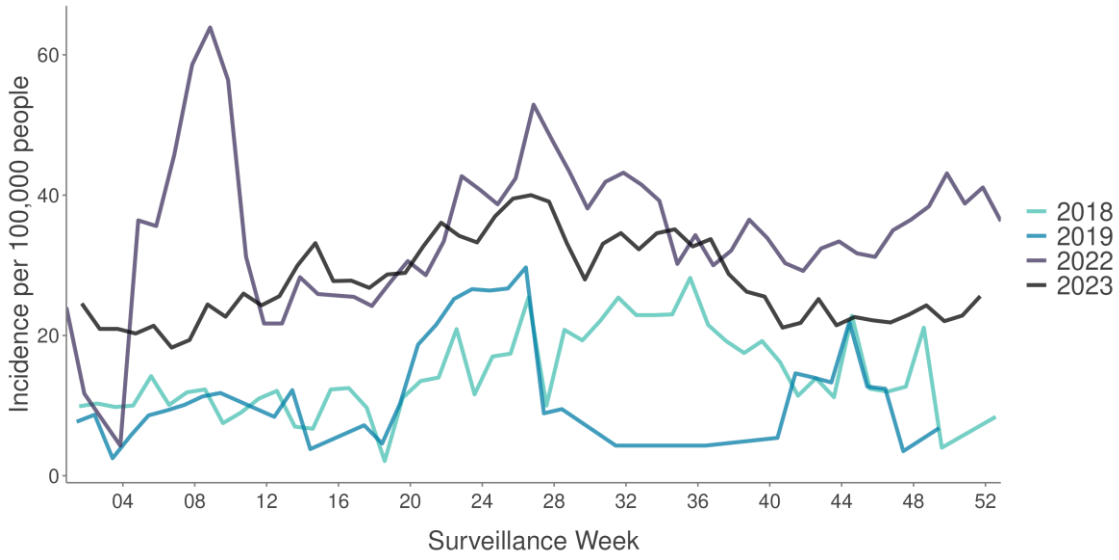
HealthLine ILI-related calls

In contrast to the WHO (2013) definition of ILI that is used in most national surveillance systems, the presence of fever is not required for categorisation as an ILI-related call by HealthLine. The HealthLine definition for ILI is therefore broader, and with the capture of less severe symptoms, results in a large volume of ILI-related calls each year. Trends in HealthLine may also be influenced by increased public awareness of particular illnesses, including media reporting.

There were 69,094 ILI-related calls to HealthLine in 2023, with an average of 1,329 calls a week. ILI-related call rates were markedly lower than for most of 2022, but higher than in pre-pandemic years (Figure 2). Call rates to HealthLine increased over the first half of 2023 to a small peak in mid-April and a winter peak in mid-July, before decreasing gradually to mid-September and remaining relatively stable thereafter through to December. The higher call rates observed in the post-pandemic period (2022–2023) may reflect an increased awareness and use of telehealth services, which began during

the pandemic (note the figure excludes the pandemic years 2020 and 2021) (Institute of Environmental Science and Research, 2023).

Figure 2: Weekly HealthLine ILI-related call rates

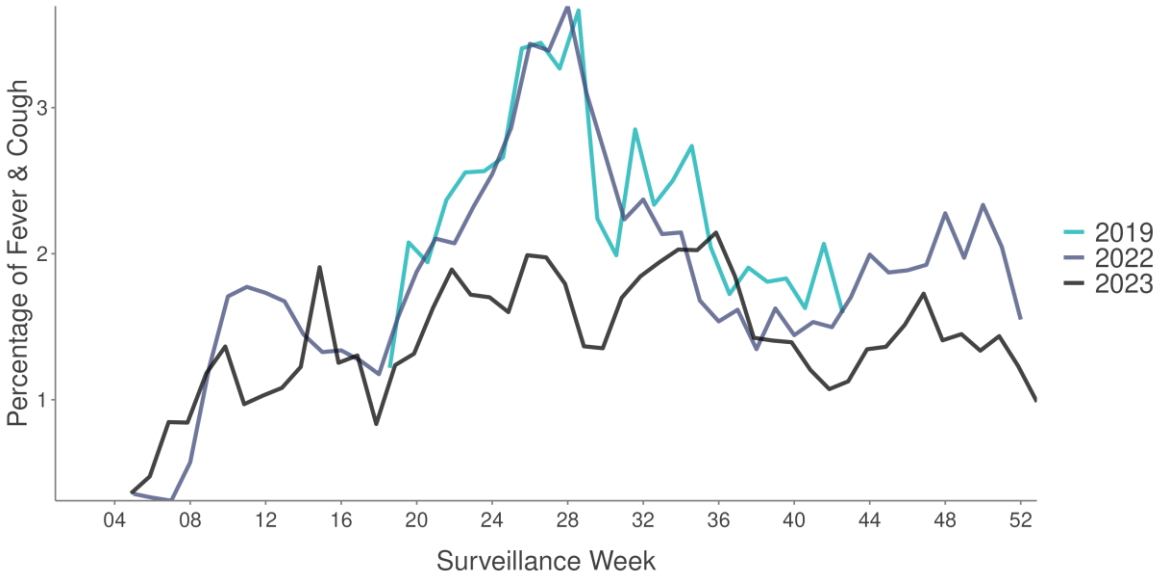


Source: HealthLine as of 30 January 2024.

FluTracking

There was a decrease in participation in the weekly FluTracking survey between 2022 and 2023. The percentages of FluTracking participants reporting both fever and cough symptoms in the previous week were lower in 2023 than the percentages reported in 2022 and pre-pandemic (Figure 3). The percentages for 2023 increased gradually from February to a peak in mid-April. There were high percentages of ILI symptoms reported through May and June, with a peak observed in each month, and another peak in ILI symptoms observed in mid-September. Although the percentages were lower, the pattern of activity towards the end of 2023 was similar to the pattern observed towards the end of 2022.

Figure 3: Percentage of FluTracking participants with ILI symptoms in the previous week



Source: FluTracking as of 25 January 2024.

Survey participants with ILI symptoms in the previous week, who reported having sought medical attention, were asked which health professional they had contacted. About one in four (21.3%) survey participants in 2023 reported seeking medical attention from a general practitioner (Table 1). There was a steady decline in the percentage seeking medical attention from a general practitioner between 2018 (30.4%) and 2023.

In 2023, about three-quarters (75.5%) of survey participants with ILI symptoms in the previous week reported taking time off work or normal duties due to their symptoms. This was consistent with the rates observed pre-pandemic (2018–2019). The rate for 2022 was slightly higher and may reflect higher rates of COVID-19 infection that year, when the recommendation to self-isolate and pandemic supports such as the Leave Support Scheme[4] were still in place.

Table 1: Actions taken in the previous week by FluTracking participants with ILI symptoms

	2018	2019	2022	2023
Contacted a GP due to symptoms	30.4%	26.2%	20.7%	21.3%
Took time off work/normal duties due to symptoms	74.2%	75.0%	81.2%	75.5%

Source: FluTracking as of 25 January 2024.

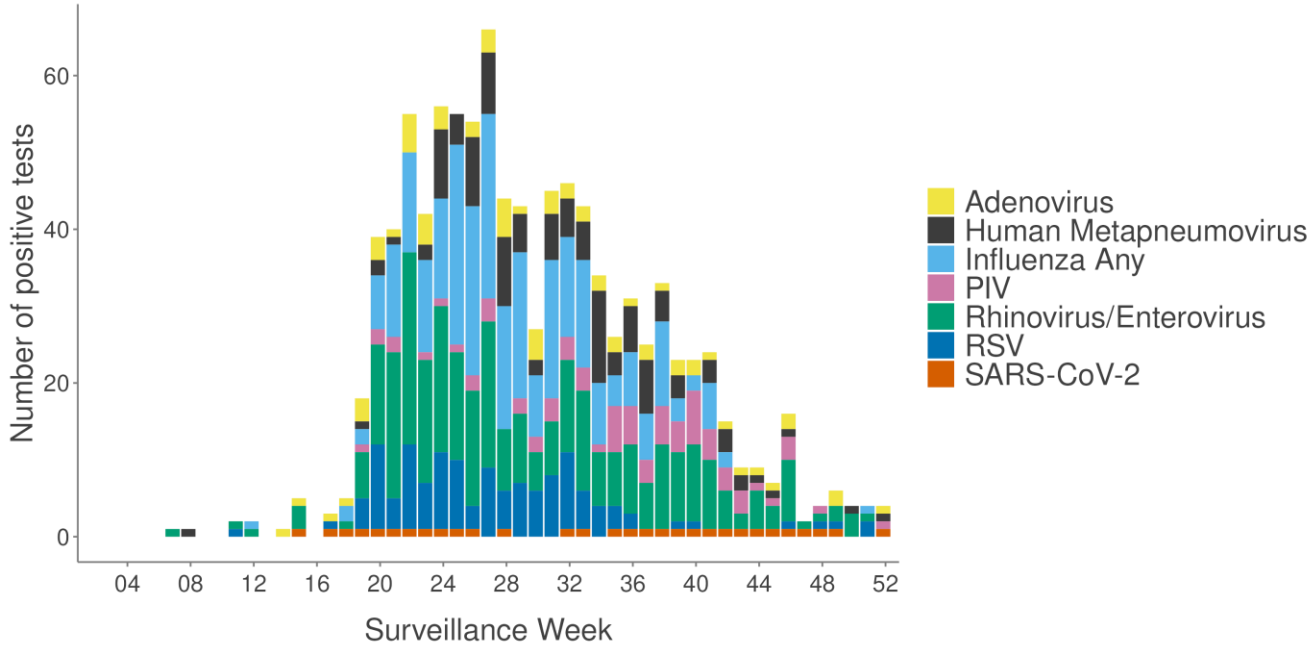
Community-based virologic surveillance

Virological surveillance at sentinel GP sites provides insight into the prevalence of respiratory viruses circulating in the community at any one time. GPs that participate in virological ILI surveillance take a nasopharyngeal or throat swab of some of the ILI patients they see each week. The samples are sent to ESR and tested for influenza, SARS-CoV-2, RSV and other respiratory viruses.

Influenza detections (Figure 4) and influenza test-positivity (Figure 5) increased from mid-May through to a peak at the end of June, before decreasing gradually through to mid-October. Rhinovirus/enterovirus was detected from mid-May through to mid-November, with a peak in detections in early June. RSV was detected from mid-May through to mid-September, and sporadically thereafter, whereas adenovirus and parainfluenza viruses (PIV) were sporadically detected in ILI patients throughout the season. Human metapneumovirus was the most common virus detected in late August. SARS-CoV-2 was detected in small numbers throughout 2023.

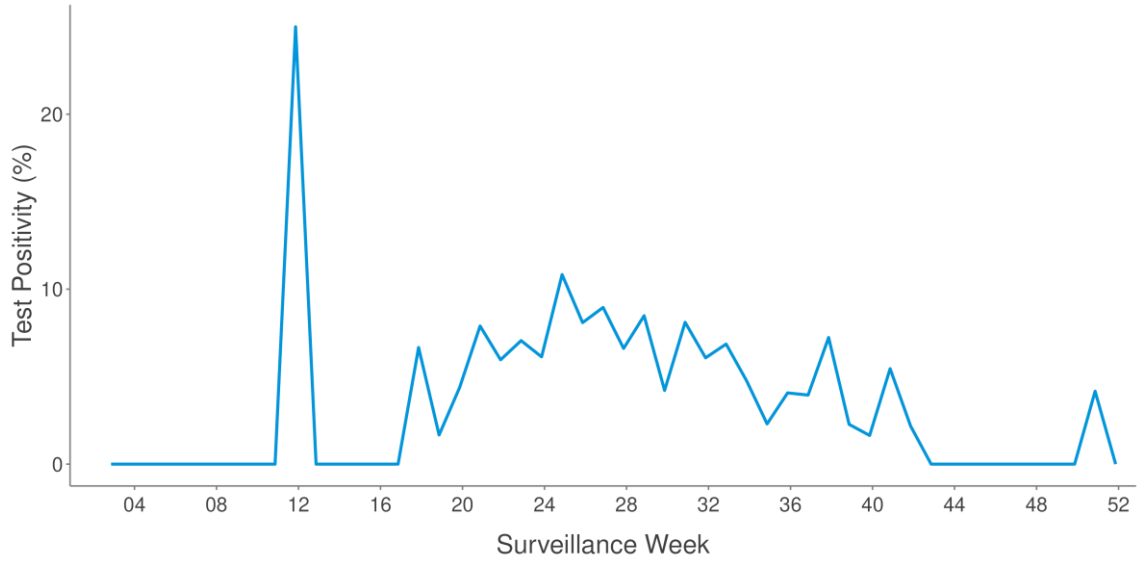
[4] The COVID-19 Leave Support Scheme was designed to help employers (and self-employed people), pay employees who had to self-isolate due to COVID-19. It was available between 6 April 2020 and 15 August 2023.

Figure 4: Weekly viruses detected through sentinel GP sampling



Source: STARLIMS and HealthLink as of 26 January 2024.

Figure 5: Weekly influenza test positivity at sentinel GP sites



Source: STARLIMS and HealthLink, as of 26 January 2024.
Note that the spike at the end of March was due to a low number of swabs.

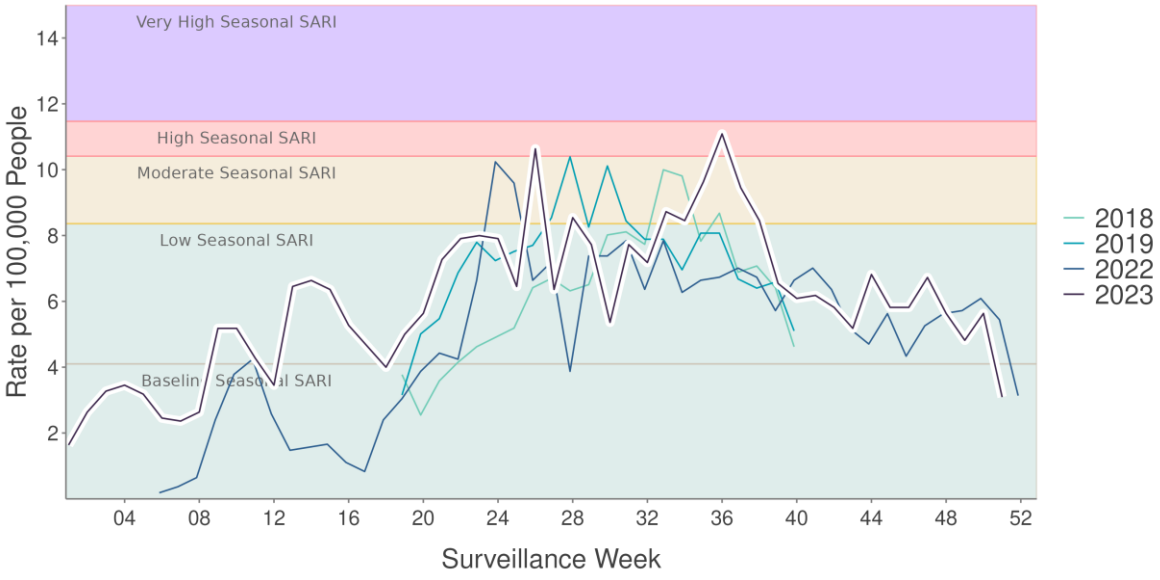
HOSPITAL-BASED SARI SURVEILLANCE

The WHO (2013) definition for SARI that is used for surveillance purposes in New Zealand is a broad definition that captures a range of respiratory viruses and bacterial infections. SARI surveillance is conducted at Kidz First, Starship, Middlemore and Auckland City hospitals, providing insight into more severe respiratory illness in the Auckland region.

There were two peaks in SARI hospitalisation rates in 2023, with four periods of elevated activity overall (Figure 6). Although SARI rates were at low levels overall for the season, they were generally higher than those observed in 2022. SARI rates increased rapidly from the outset in 2023, with a surge in activity observed in March and April, before rates increased further to a peak at the end of June. Rates increased again from the beginning of August, peaking again in mid-September. The first peak in the SARI rates for 2023 occurred later than the first peak in 2022, and the second peak in 2023 occurred later than any peak observed in recent years. Influenza was the predominant virus contributing to this activity, boosted by other respiratory viruses (Figure 7).

Following the second SARI peak in mid-September, activity remained moderately high until the end of 2023. This was similar to the pattern observed in 2022. The degree to which SARI activity was elevated towards the end of the year relative to pre-pandemic years is unknown, as SARI surveillance on Auckland hospital respiratory wards typically ended by October in pre-pandemic years.

Figure 6: Weekly SARI (any cause) hospitalisation rates



Source: Redcap SARI Surveillance as of 30 January 2024.
Data include SARI hospitalisations from Kidz First, Starship, Middlemore and Auckland City hospitals.

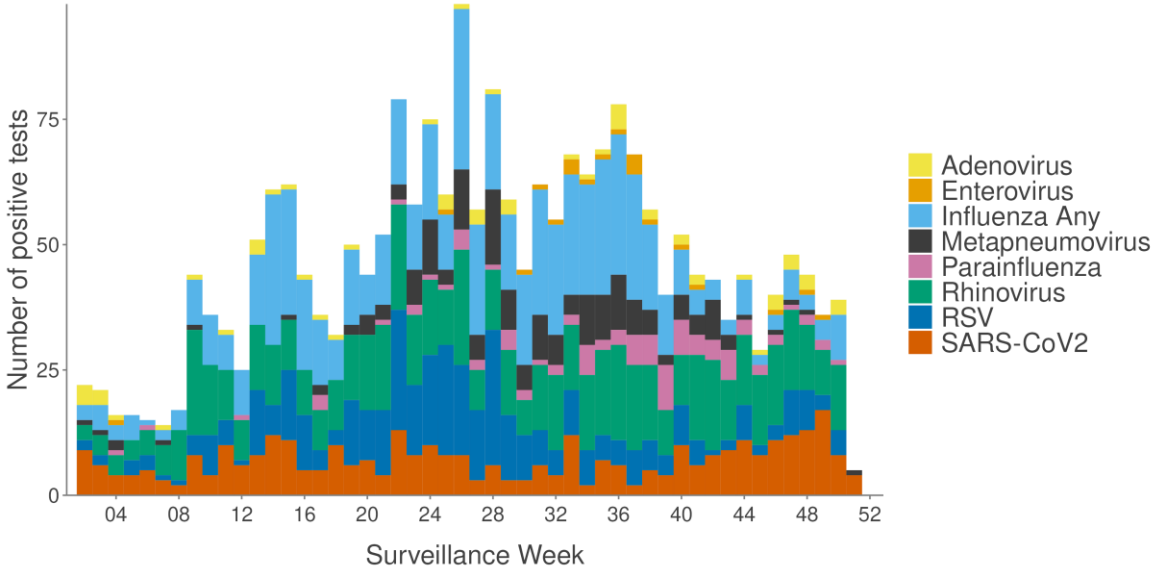
SARI virology

SARI patients are swabbed for respiratory viruses either as a part of their routine care, or by SARI surveillance nurses while in hospital. The swabs are tested for multiple viruses including influenza, rhinovirus, enterovirus, adenovirus, human metapneumovirus, parainfluenza virus (PIV), RSV and SARS-CoV-2.

SARI virus detections in 2023 followed a quadrivial distribution (Figure 7). The first wave was driven primarily by influenza, but boosted by rhinovirus, RSV and SARS-CoV-2 detections. The second wave peaked at the beginning of July, fuelled by influenza, metapneumovirus, RSV and rhinovirus. The

third wave began in August, peaking in mid-August, and continuing through to the end of September. It was driven primarily by influenza, with sizeable contributions from metapneumovirus and rhinovirus. Finally, there was a small, but sustained wave at the end of 2023, fuelled by rhinovirus and a surge in the HK.3 and EG.5 SARS-CoV-2 variants (Figure 12). SARS-CoV-2 detections were otherwise low throughout 2023.

Figure 7: Weekly viruses detected through sentinel hospital SARI sampling



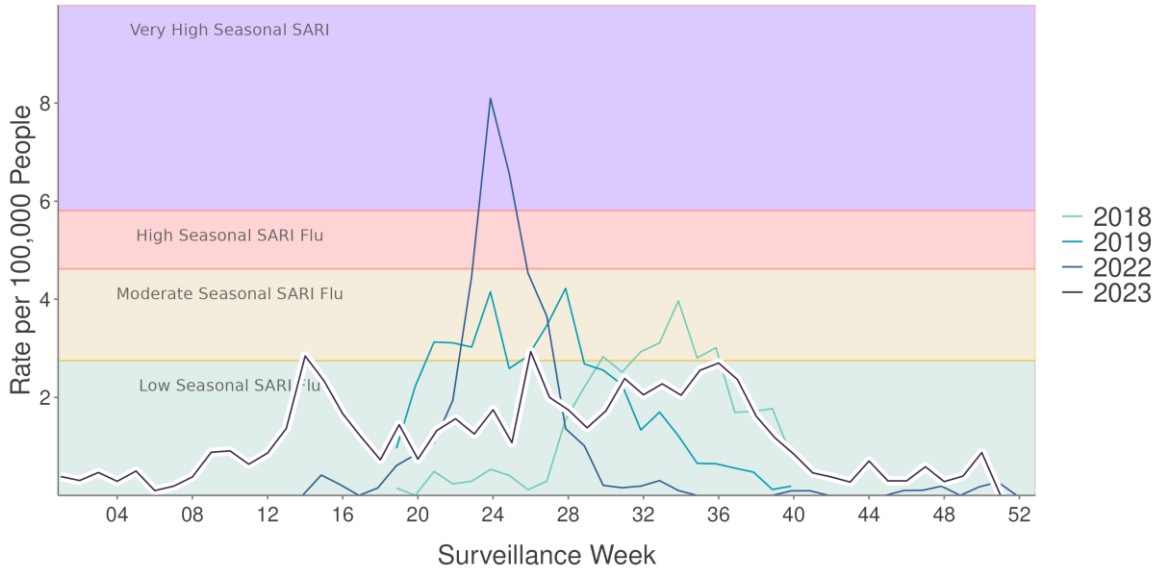
Source: Auckland City and Middlemore Hospital virology as of 30 January 2024.

Influenza-positive SARI hospitalisation rates were in the low seasonal range throughout 2023 (Figure 8). There were three peaks in activity during the year, with a peak in mid-April, then in the beginning of July and a final peak in mid-September 2023. Thereafter, influenza-positive SARI rates rapidly decreased, and by October, the rate had fallen below one case per 100,000 people.

Influenza A was the dominant strain detected among influenza-positive SARI patients throughout 2023. About 31% of these patients were positive for A/H1 and 7% for AH/3. Influenza B was detected in a quarter (24%) of influenza-positive SARI patients, and most were admitted during the cooler months, between April and September 2023. More than half of the influenza B SARI patients were children <15 years of age.

None of the peaks in influenza-positive rates during 2023 were as high as the peak observed in June 2022, which is thought to have been due to reduced baseline immunity following an absence in circulation of respiratory viruses during the pandemic (Institute of Environmental Science and Research, 2023).

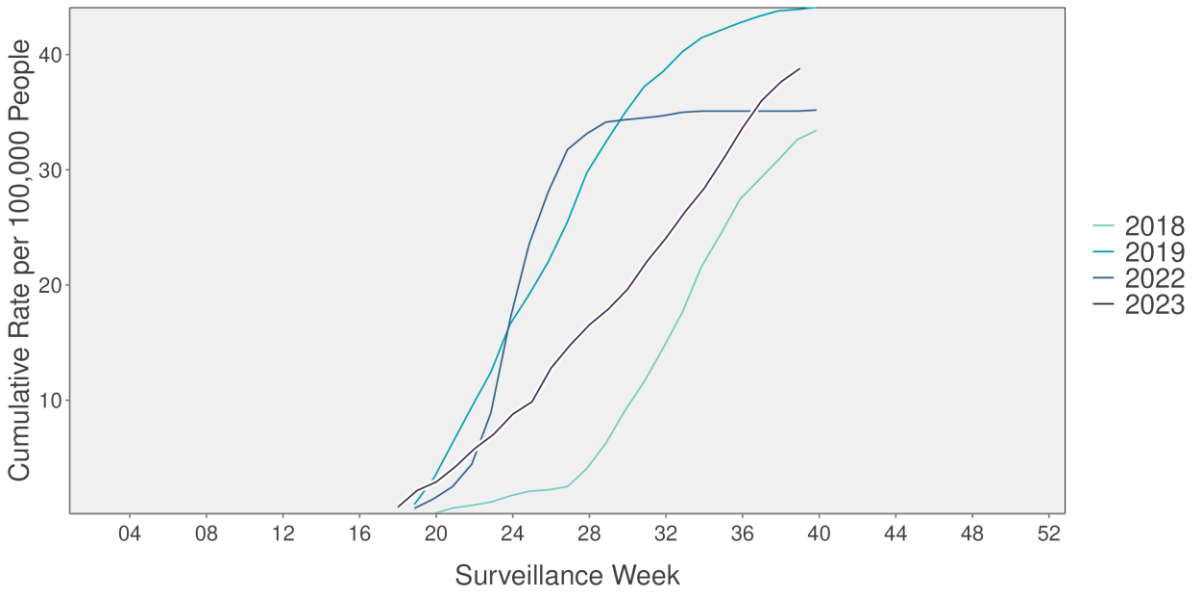
Figure 8: Weekly influenza-positive SARI hospitalisation rates



Sources: Auckland City and Middlemore Hospital virology as of 30 January 2024.
There were no influenza-positive SARI hospitalisations in 2020 and 2021.

The cumulative incidence rate for influenza-positive SARI hospitalisations in 2023 was between 2018 and 2019 levels (Figure 9), which were considered moderately severe seasons (Institute of Environmental Science and Research, 2023).

Figure 9: Cumulative rate of influenza-positive SARI hospitalisations

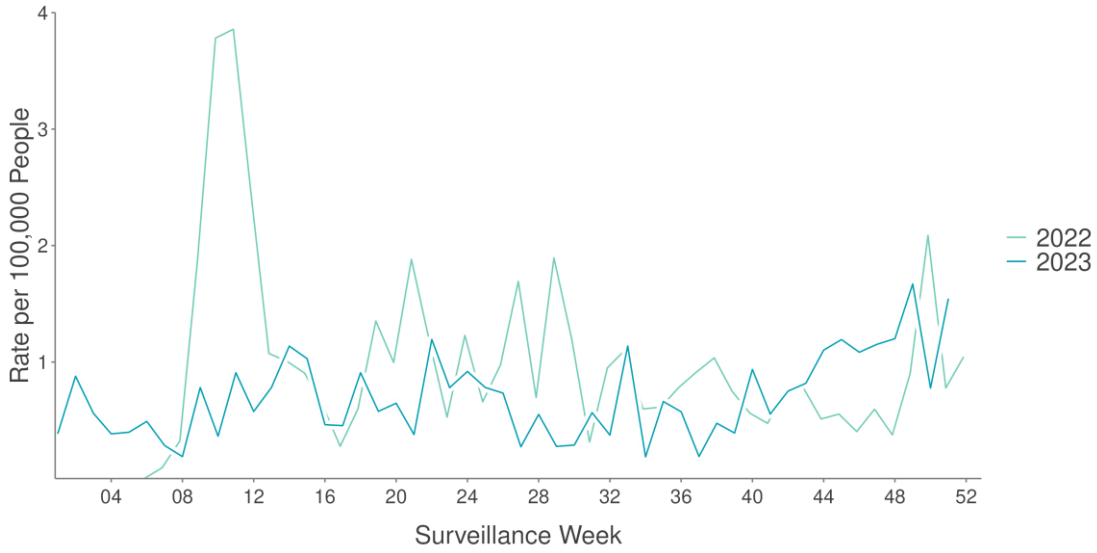


Sources: Auckland City and Middlemore Hospital virology as of 30 January 2024. Redcap SARI Surveillance Lite Project as of 30 January 2024.
There were no influenza-positive SARI hospitalisations in 2020 and 2021.

SARS-CoV-2-positive SARI hospitalisation rates were relatively low in 2023, when compared to the rates in 2022 (Figure 10 and Figure 11). There was a small surge in activity towards the end of the year, coinciding with an increase in the EG.5 and HK.3 variants, and the emerging JN.1 variant (Figure 12).

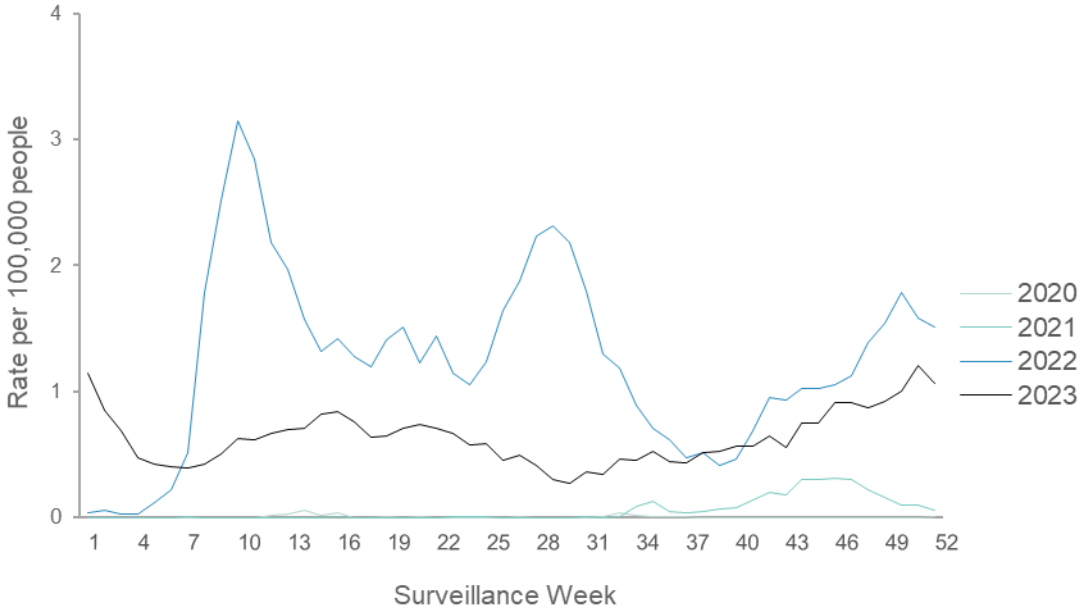
The large peak observed around late February in 2022 was due to the Omicron variant (Institute of Environmental Science and Research, 2023). After late March the rate decreased and remained below two cases per 100,000 for the rest of 2022.

Figure 10: Weekly SARS-CoV-2-positive SARI hospitalisation rates



Sources: Auckland City and Middlemore Hospital virology as of 30 January 2024. Redcap SARI Surveillance Lite Project as of 30 January 2024.

Figure 11: Weekly hospital admissions for COVID-19



Data source: (Te Whatu Ora, 2024).

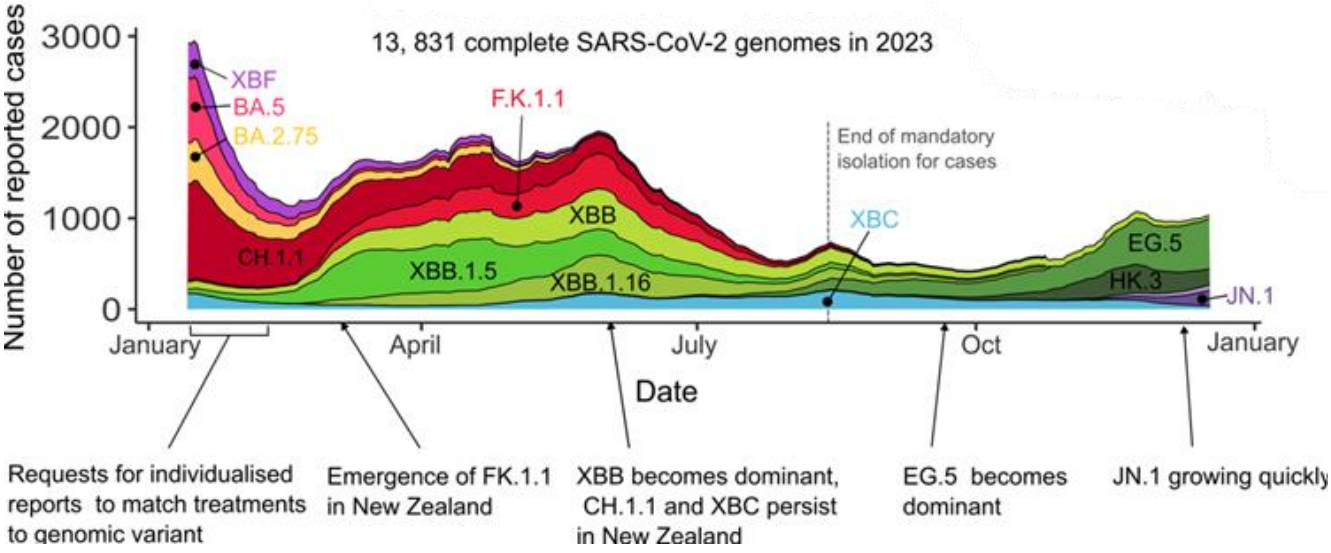
The data include all admissions with a COVID-19 diagnosis from hospitals in the Northland, Waitemata, Auckland, Counties Manukau, Waikato, Capital & Coast, Hutt, Nelson Marlborough, Canterbury, West Coast and Southern DHB areas.

COVID-19 virology

ESR undertakes SARS-CoV-2 genomic surveillance across New Zealand. A proportion of swabs taken by health professionals for SARS-CoV-2 diagnostic testing are sent to ESR for testing. Note that this excludes rapid antigen tests or 'RATs'. Due to the voluntary reporting process for positive RAT results, official COVID-19 cases recorded by the Health New Zealand are likely to underestimate true case numbers.

Figure 12 shows the number of COVID-19 cases reported to Health New Zealand[5] in 2023 and the distribution of genomic variants, by month. The figure shows that the XBC variant was present throughout 2023 with a low level of incidence. At the beginning of the year, the CH.1.1 variant, a descendent of BA.2.75 and the original Omicron variant, was dominant in New Zealand. By April, there were several new variants on the increase, with XBB.1.5 dominating, followed by CH.1.1 – still widely spread. The FK.1.1 and XBB variants were on the rise, and the XBB.1.16 variant was emerging. By the middle of August, these variants had all decreased in incidence and the EG.5 variant began to emerge. The EG.5 variant was dominant thereafter, along with HK.3 (descendent of EG.5) to the end of the year. A new variant – JN.1 – emerged in the final weeks of 2023 and began to grow rapidly. This variant is a descendent of the Omicron lineage and would become the dominant variant in New Zealand by February 2024 (Institute of Environmental Science and Research, 2024).

Figure 12: COVID-19 cases by genomic variant 2023



Source: (Institute of Environmental Science and Research, 2024).
Genomic variants were modelled for cases identified via a positive RAT and all data were subject to smoothing techniques.

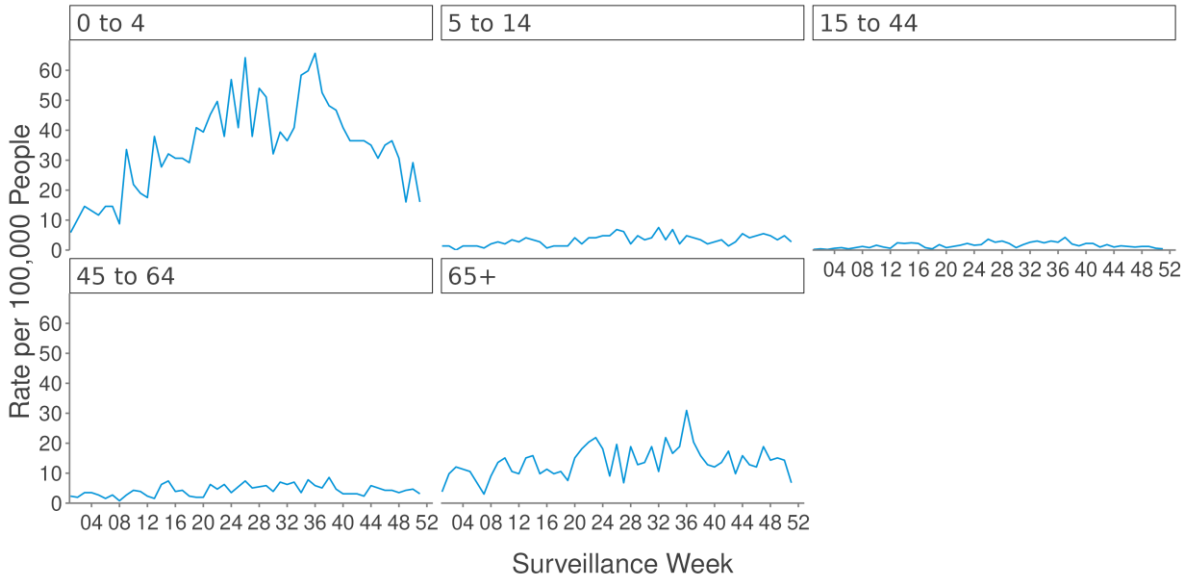
SARI cases by age

Children under 5 years of age experienced high SARI hospitalisation rates throughout 2023, with two peaks in the rates observed at the end of June and mid-September when the rates for this age group were at least twice as high as any other age group (Figure 13). These rates were fuelled primarily by influenza, with sizeable contributions from other respiratory viruses. Influenza A and B were co-dominant with the first peak at the end of June, and influenza A was dominant with the second peak (Figure 14).

Although the SARI hospitalisation rates for people 65 years or older were markedly lower than the rates observed for young children, the rates were consistently higher than for other age groups throughout the year, with high activity observed from June onwards to a peak in mid-September.

[5] The data in the figure includes positive cases from RATs in the total numbers of COVID-19 cases. The distribution of variants across positive cases from RATs were modelled based on the existing frequencies of variants in circulation at a given point in time.

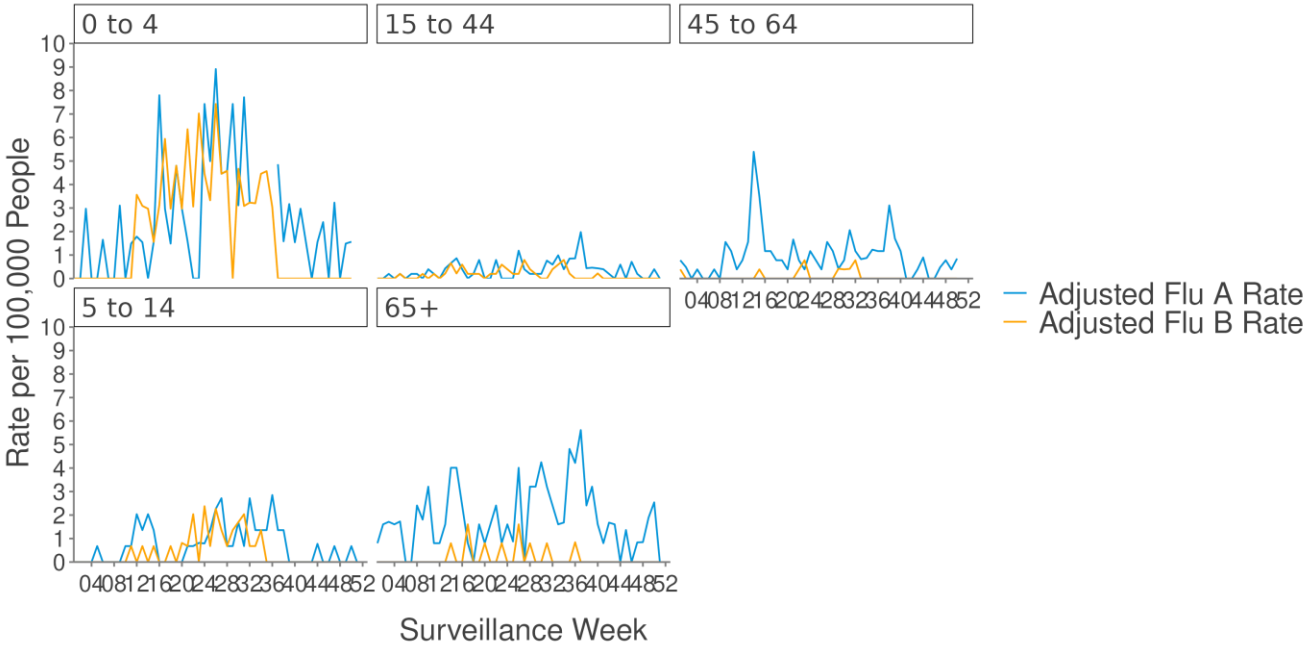
Figure 13: Weekly SARI (any cause) hospitalisation rates, by age group



Source: Redcap SARI Surveillance Lite Project as of 30 January 2024.

Most of the influenza detected in SARI patients was influenza A, with high rates observed among young children 0–4 years and adults 65 years or older (Figure 14). Influenza B tends to cause more severe illness in children than adults, which is reflected in the figure. Note that the rates presented in the figure have been adjusted, with an expected result added to the data for the patients without an actual test result. The expected results were derived based on overall test positivity.

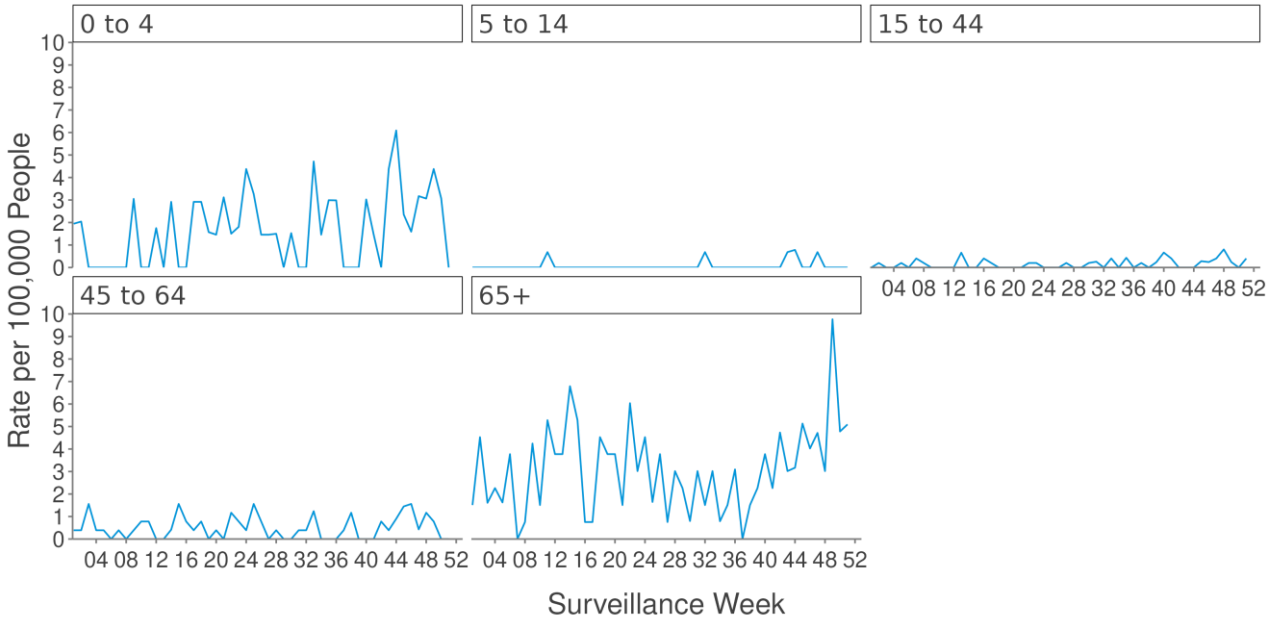
Figure 14: Weekly influenza-positive SARI hospitalisation rates (adjusted), by age group and influenza sub-type



Source: Auckland City and Middlemore Hospital virology as of 30 Jan 2024. Redcap SARI Surveillance Lite Project as of 30 January 2024. Patient records without test results were adjusted by adding an 'expected' result, based on overall test positivity. This adjustment or imputation method impacted about 4% of the data and is likely to have had a minimal impact on final estimates.

The highest rates of SARS-CoV-2-positive SARI throughout the year were observed among those 65 years or older, followed by those under 5 years (Figure 15). SARS-CoV-2-positive SARI rates for children 5–14 years and adults 15–44 years were very low throughout the year.

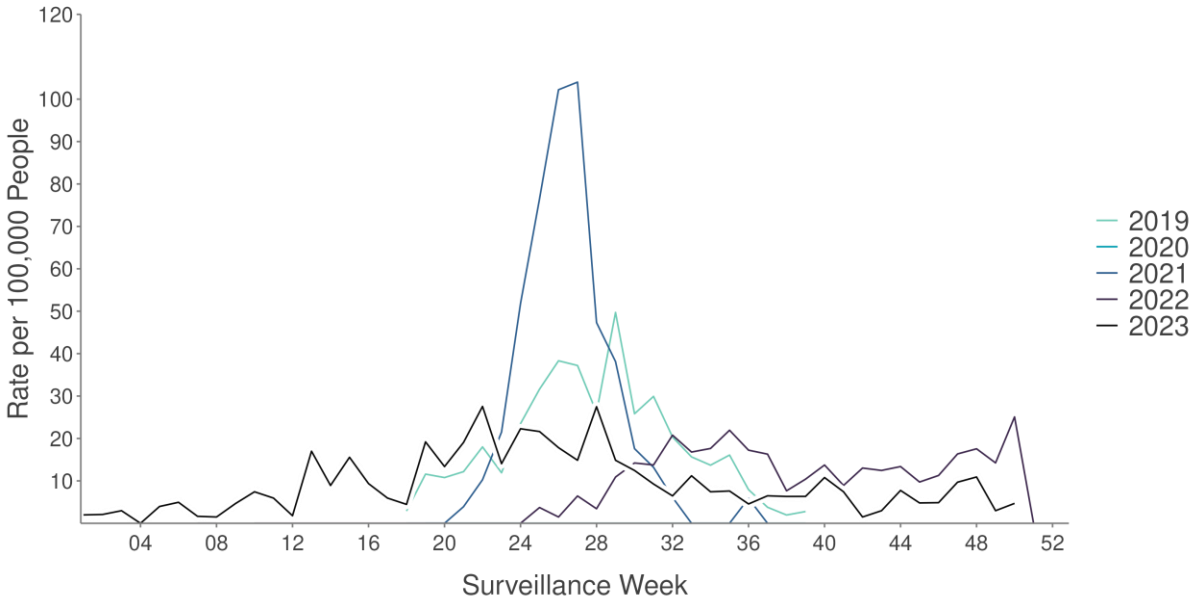
Figure 15: Weekly SARS-CoV-2-positive SARI hospitalisation rates, by age group



Source: Auckland City and Middlemore Hospital virology as of 30 January 2024. Redcap SARI Surveillance Lite Project as of 30 January 2024.

Sustained, moderate rates of RSV were observed for SARI patients aged 0–4 years in 2023 (Figure 16). There were peaks in RSV around the winter months, but these were very modest in comparison to the peaks observed in 2019 and 2021. There was a particularly severe RSV season in 2021, with a very high peak between June and August, after which very little RSV was detected in this age group.

Figure 16: Weekly RSV-positive SARI hospitalisation rates, children 0–4 years

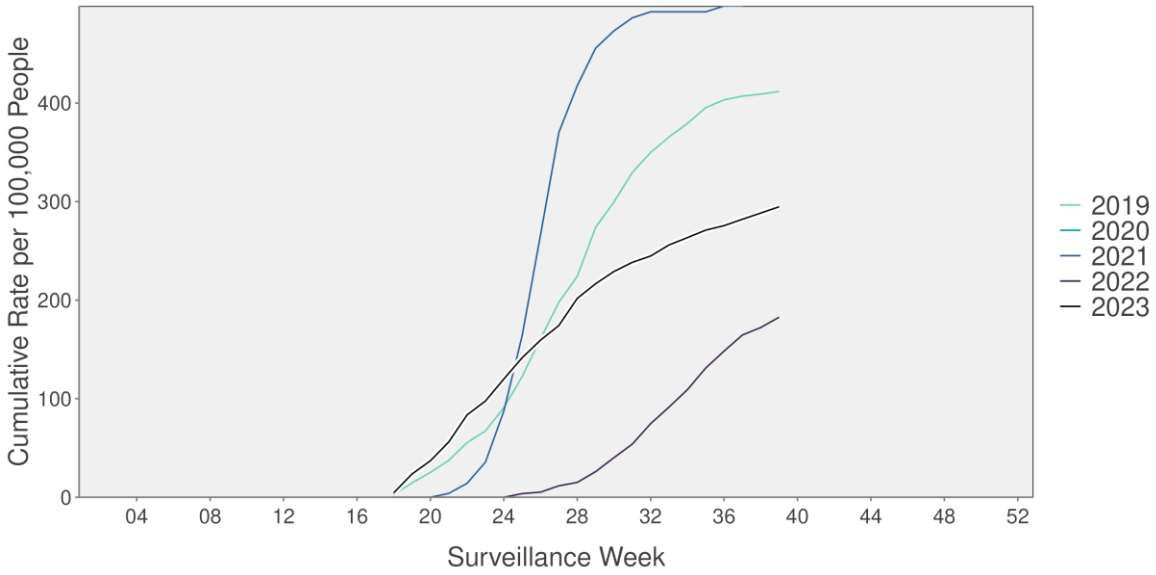


Source: Auckland City and Middlemore Hospital virology as of 30 January 2024. Redcap SARI Surveillance Lite Project as of 30 January 2024.

There were no RSV-positive SARI hospitalisations in 2020 for children 0–4 years.

The cumulative incidence of RSV-positive SARI hospitalisations for young children (0–4 years) in 2023 was between 2019 and 2022 levels, well below the cumulative rates recorded for 2021, which included case numbers from the peak observed during the winter months (Figure 17). Although the cumulative rate for 2023 was similar to the rate for 2019 in the first half of the year, the cumulative rate for 2023 did not increase as rapidly as the rate for 2019 in the latter half of the year.

Figure 17: Cumulative rates of RSV-positive SARI hospitalisations, children 0–4 years



Sources: Auckland City and Middlemore Hospital virology as of 30 January 2024. Redcap SARI Surveillance Lite Project as of 30 January 2024.

There were no RSV-positive SARI hospitalisations in 2020 for children 0–4 years.

SARI cases by ethnicity

Health inequalities between population groups are well documented in New Zealand. The respiratory disease burden for Māori and Pacific peoples has previously been shown to be greater than for people from other ethnic groups (Barnard & Zhang, 2021), with the risk of hospitalisation for respiratory infection higher for Māori and Pacific peoples (Institute of Environmental Science and Research, 2023; Steyn et al., 2021) and their vaccination rates generally lower than for other ethnic groups (Te Whatu Ora, 2023).

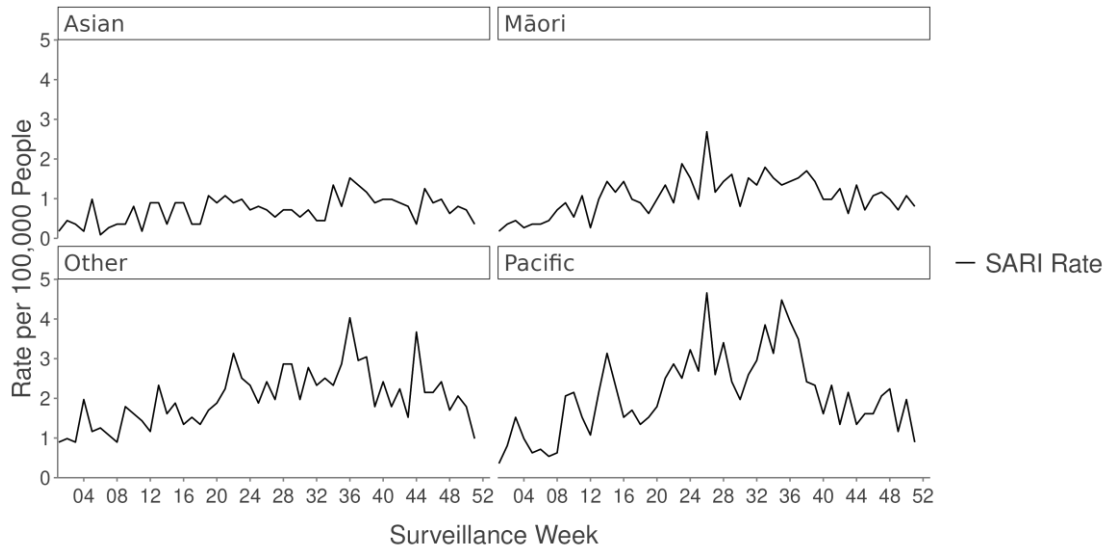
In 2023, Auckland-based SARI hospitalisation crude rates for Asian peoples were low in comparison to all other ethnic groups, whilst Pacific peoples had the highest SARI hospitalisation rates (Figure 18). Pacific peoples had the highest SARS-CoV-2-positive SARI rates of all ethnic groups in 2023, with sustained high hospitalisation rates associated with RSV (Figure 19).

In contrast, although Māori SARI hospitalisation rates for COVID-19 and RSV were higher than the rates for Asian peoples, they were lower than the rates for Pacific peoples and similar to, or lower than the rates for ‘Other’ ethnic groups. These trends were also shown through Health New Zealand COVID-19 admission reporting.

Influenza-positive SARI hospitalisation rates for Māori were lower than the rates for Pacific and ‘Other’ peoples in 2023 and were more similar to the rates for the Asian ethnic group. Influenza-positive rates for Pacific peoples were similar to the rates for ‘Other’ ethnic groups.

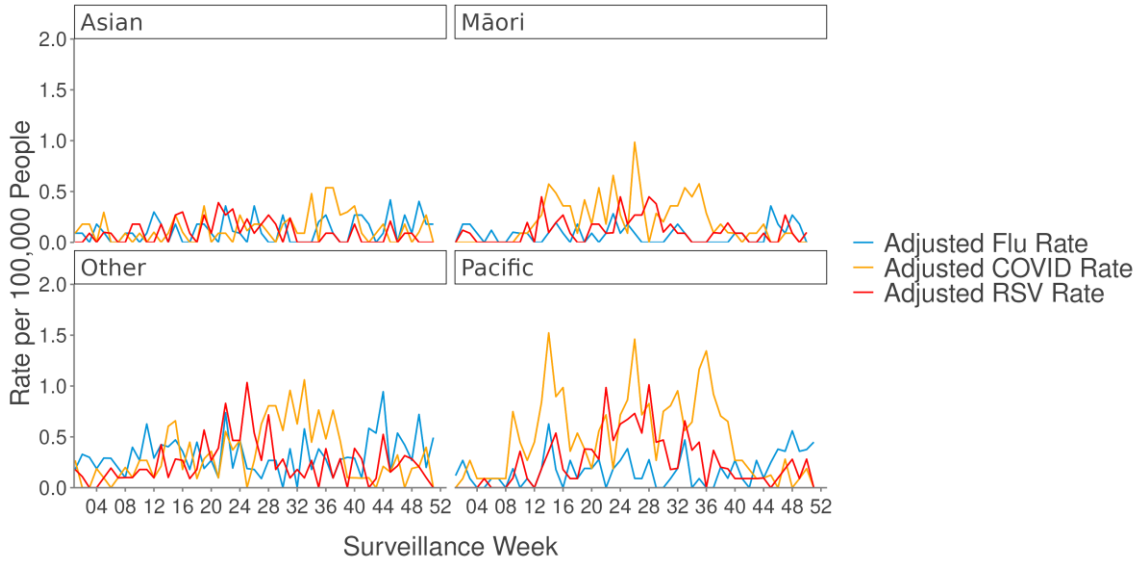
Note the pathogen-specific rates presented in Figure 19 have been adjusted, with an expected result added to the data for the 4% of patients without an actual test result. The expected results were derived based on overall test positivity.

Figure 18: Weekly SARI hospitalisation rates (any cause), by ethnicity



Source: Redcap SARI Surveillance Lite Project as of 30 January 2024.

Figure 19: Weekly SARI hospitalisation rates (adjusted), by respiratory virus and ethnic group



Source: Redcap SARI Surveillance Lite Project as of 30 January 2024.

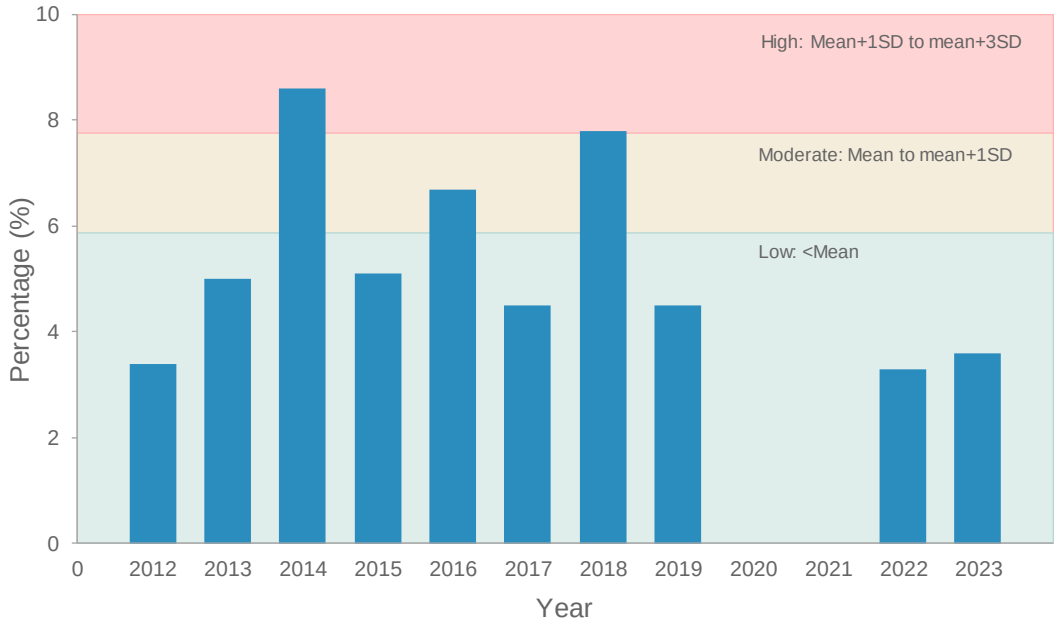
Patient records without test results were adjusted by adding an 'expected' result, based on overall test positivity. This adjustment or imputation method impacted about 4% of the data and is likely to have had a minimal impact on final estimates.

Severity of illness among influenza positive SARI patients

The severity of influenza illness can be inferred by comparing the proportion of influenza-positive SARI patients in ICU relative to all influenza-positive SARI patients admitted to hospital.

Figure 20 shows the ratio of influenza-associated ICU SARI admissions to influenza-associated SARI hospitalisations, expressed as a percentage, between 2012 and 2023. The figure indicates that the severity of influenza illness in 2023 was low, relative to pre-pandemic years.

Figure 20: Influenza-positive SARI ICU patients as a percentage of all influenza-positive SARI patients



Source: Auckland City and Middlemore Hospital virology as of 30 January 2024. Redcap SARI Surveillance Lite Project as of 30 January 2024.

INFLUENZA VACCINE COVERAGE AND VACCINE EFFECTIVENESS

Influenza vaccine coverage

The influenza vaccine is available from the beginning of April each year in New Zealand and is recommended for everyone over the age of 6 months. The vaccine is funded for vulnerable people, and in 2023 the following groups were eligible for free influenza vaccines:

- People 65 years or older.
- Māori or Pacific people 55 years or older.
- Children from 6 months to 12 years.
- People with underlying health conditions[6], including heart disease, cancer, diabetes, and serious asthma.
- People with significant mental illness[6], such as schizophrenia, or those currently accessing mental health services.
- Pregnant women.

Additionally, some people may receive a voucher from their employer for a free influenza vaccine.

Table 2 provides estimates for free vaccine uptake by eligible people in 2023. The estimates suggest one in ten (10.1%) children between 6 months and 12 years, almost a third (32.2%) of Māori and Pacific adults 55–64 years, and almost two thirds (63.9%) of adults 65 years or older, received a vaccine in 2023.

Table 2: Influenza vaccination coverage data for eligible groups

Measure	6 months–12 years	55–64 years Māori & Pacific	65 years+
People who received a vaccine	67,074	42,220	509,364
Number of eligible people	664,321	131,245	797,042
HSU coverage rate	10.1%	32.2%	63.9%

Source: Aotearoa Immunisation Register (AIR) as of February 22, 2024.
Coverage statistics are based on the Ministry of Health's Health Service User (HSU) data for the 2023/24 financial year.
Data may exclude some privately funded influenza vaccinations.

Vaccine effectiveness estimates

Studies of vaccine effectiveness (VE) assess or measure how well a vaccine protects a population from disease. Although vaccines are assessed for efficacy during the clinical trial phase of development, trials do not replicate real world populations and real-life situations, which can vary considerably from a study group environment.

[6] Vaccine coverage for this group is not presented in this report as medical condition data are not available in reporting systems.

VE for the 2023 seasonal quadrivalent influenza vaccine was assessed from GP ILI surveillance data, using a test-negative design. The crude VE was 72.7% (95% CI 62.8–80.2%) across all ages, with 88.8% (95% CI 74.4–95.8%) for adults 65 years or older (Table 3). This represents good VE for a seasonal vaccine, although statistical precision is low, due to small numbers. Patients were determined to be vaccinated if they had received the seasonal influenza vaccine at least two weeks before consultation date.

Table 3: GP ILI-based seasonal influenza vaccine effectiveness estimates

	Influenza positive		Influenza negative		Crude VE (%)
	Vaccinated-Yes	Vaccinated-No	Vaccinated-Yes	Vaccinated-No	VE % (95% CI)
All ages	52	544	458	1309	72.7 (95% CI 62.8–80.2)
0–18 years	8	118	54	217	72.7 (95% CI 39.7–89.1)
19–64 years	37	356	279	941	64.9 (95% CI 49.2–76.3)
65 years+	7	68	122	132	88.8 (95% CI 74.4–95.8)

Source: (Institute of Environmental Science and Research, 2024).
With few observations in some strata, crude VE estimates will provide unreliable and non-significant estimates.

VE was also assessed using SARI hospital surveillance data and a test-negative design. The crude VE for adults 19–64 years, was 61.9% (95% 7.7–86.3%) (Table 4). This represents good VE against severe disease for a seasonal vaccine, although statistical precision is low due to small numbers. Patients were determined to be vaccinated if they had received the seasonal influenza vaccine at least two weeks before their hospital admission date.

Table 4: Hospital SARI-related seasonal influenza vaccine effectiveness estimates

	Influenza positive		Influenza negative		Crude VE (%)
	Vaccinated-Yes	Vaccinated-No	Vaccinated-Yes	Vaccinated-No	VE % (95% CI)
All ages	20	197	142	579	58.6 (95% CI 31.4–76.1)
0–18 years	6	123	24	351	28.7 (95% CI -84.7–76.7)
19–64 years	28	199	128	428	61.9 (95% CI 7.7–86.3)
65 years+	7	24	68	92	60.5 (95% CI -1.8–86.4)

Source: (Institute of Environmental Science and Research, 2024).
With few observations in some strata, crude VE estimates will provide unreliable and non-significant estimates.

INFLUENZA VIRUS CHARACTERISATION

Laboratory-based surveillance for influenza is conducted all-year-around by the New Zealand virus laboratory network, consisting of the WHO National Influenza Centre (NIC) at ESR and six hospital laboratories at Auckland, Waikato, Wellington, Christchurch and Dunedin, serving nearly 70% of the population. This laboratory network tests specimens ordered by clinicians for hospital in-patients and outpatients during routine viral diagnosis. In addition, the network conducts testing for public health surveillance including hospital-based SARI and sentinel GP-based surveillance.

The WHO NIC at ESR receives samples from local hospital laboratories for further typing from active surveillance (sentinel ILI and SARI) as well as passive surveillance (i.e. mainly hospital in-patients and outpatients during routine viral diagnosis).

Surveillance activities include antigenic typing of influenza virus isolates and vaccine matching to provide recommendations to the Australian Influenza Vaccine Committee (AIVC) each year for the southern hemisphere seasonal influenza vaccine.

Influenza virus identifications by subtype and lineage

A total of 10,165 influenza viruses were detected in 2023 by WHO NIC, with influenza A representing 63.2% (6,423/10,165) and influenza B 36.8% (3,742/10,165) of all influenza viruses (Institute of Environmental Science and Research, 2024). Among 1,861 subtyped and lineage-typed viruses, 63.9% (1,190/1,861) were A(H1N1)pdm09 viruses, 6.1% (114/1,861) were A(H3N2) viruses, and 29.9% (557/1,861) were B/Victoria lineage viruses.

Among the 487 influenza-positive specimens from SARI patients in 2023, 343 were influenza A (70.4%). Of the influenza A-positive specimens, 175 were subtyped further (51.0%), of which 165 were A(H1N1)pdm09 (94.3%) and 10 were A(H3N2) (5.7%).

Virus-vaccine matching

Most of the influenza A(H1N1)pdm09 viruses detected in 2023 belonged to clade 5a.2 (i.e. 6B.1A.5a.2) (Institute of Environmental Science and Research, 2024). Recent assessments of the two major subclades 5a.2a and 5a.2a.1 that have been circulating in different geographic regions indicate reduced levels of vaccine recognition. This prompted a recommendation to AIVC to change the A(H1N1)pdm09 component in the 2024 southern hemisphere seasonal influenza vaccine to one which is expected to provide greater protection against this influenza A seasonal virus.

The vast majority of A(H3N2) viruses detected in 2023 had HA genes that belonged to the clade 2 (i.e. 3C.2a1b.2a.2) genetic group. Evolutionary change has led to the emergence of several new subclades circulating in different regions. Some of the new subclade viruses in circulation were shown to be a poor match with the A(H3N2) virus component of the 2023 vaccine, prompting a recommendation to change the A(H3N2) component of the 2024 vaccine.

The circulating influenza B viruses characterized in 2023 were of the B/Victoria/2/87 lineage. The more recent of these viruses expressed HA genes belonging to subclade 3a.2 (i.e. 1A.3a.2). They were found to be a good match with the influenza B component of the 2023 southern hemisphere seasonal influenza vaccine and a recommendation was made to continue to use the same vaccine strain for 2024.

Antiviral resistance data

The WHO National Influenza Centre at ESR employs a phenotypic method (fluorometric neuraminidase inhibition assay) for the surveillance of anti-viral drug resistance in influenza viruses.

In 2023, the fluorometric neuraminidase inhibition assay was used to test 189 influenza viruses for antiviral resistance (Institute of Environmental Science and Research, 2024). The results showed that all were sensitive to both oseltamivir and zanamivir antiviral medications.

INFLUENZA VACCINE COMPOSITION FOR 2024 SEASON

Following review and evaluation of the epidemiology and the antigenic and genetic information available on recent influenza viruses in circulation, AIVC recommended the following composition for the 2024 southern hemisphere influenza seasonal vaccine:

Egg-based quadrivalent influenza vaccines:

- an A/Victoria/4897/2022 (H1N1)pdm09-like virus;
- an A/Thailand/8/2022 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage) - like virus.

Cell-based or recombinant-based quadrivalent influenza vaccines:

- an A/Wisconsin/67/2022 (H1N1)pdm09-like virus;
- an A/Massachusetts/18/2022 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus.

The recommendation for the B/Yamagata lineage component of quadrivalent influenza vaccines remained unchanged from previous recommendations:

- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

However, the WHO Influenza Vaccine Composition Advisory Committee recommended that this antigen be excluded from the 2024 southern hemisphere seasonal influenza vaccine, given an absence of evidence that the B/Yamagata lineage virus remains in circulation, as it has not been detected in recent years (Institute of Environmental Science and Research, 2024). AIVC noted this position and supports the committee's views.

FUTURE DIRECTIONS

Improving GP virologic surveillance

The COVID-19 pandemic response impacted heavily on GPs and other frontline health workers. We experienced lower levels of GP participation in the voluntary sentinel respiratory virus surveillance system following the pandemic. Work is ongoing to increase GP recruitment and boost participation of existing general practices.

Enhancing GP syndromic surveillance systems

During the COVID-19 pandemic, the syndromic monitoring component of the ESR sentinel ILI GP surveillance programme was paused due to major changes in patient management in primary care. This system relied on manual data entry of every ILI patient presenting to a participating GP. Currently, only the virological sampling component of this system is operating.

GP syndromic surveillance information continues to be obtained from HealthStat, with an expanded network of about 400 practices, compared to 90 practices pre-pandemic. Work is underway to enhance the surveillance system with monitoring of both non-COVID-19 ILI and COVID-19 coded consultations going forward.

Further development of SARI surveillance

Currently, SARI surveillance is undertaken only at Auckland and Middlemore hospitals. The current system, which requires research nurses to collect data on SARI patients, is resource intensive and costly, and therefore is not scalable across New Zealand. ESR is currently exploring options to refine data collection processes through the sentinel sites.

Eclair repository

Work is ongoing to allow the provision of all positive and negative respiratory panel test results performed in community diagnostic laboratories to be shared with ESR through the Eclair clinical result repository. This will allow monitoring of test positivity rates as an indicator of the prevalence of different respiratory viruses.

Wastewater pilot

A pilot study is underway to evaluate the usefulness of wastewater surveillance for influenza and RSV.

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He Pūtaiao, He Tāngata

INSTITUTE OF ENVIRONMENTAL
SCIENCE AND RESEARCH LIMITED

Kenepuru Science Centre
34 Kenepuru Drive, Kenepuru, Porirua 5022
PO Box 50348, Porirua 5240
New Zealand
T: +64 4 914 0700 **F:** +64 4 914 0770

Mt Albert Science Centre
120 Mt Albert Road, Sandringham, Auckland 1025
Private Bag 92021, Auckland 1142
New Zealand
T: +64 9 815 3670 **F:** +64 9 849 6046

NCBID – Wallaceville
66 Ward Street, Wallaceville, Upper Hutt 5018
PO Box 40158, Upper Hutt 5140
New Zealand
T: +64 4 529 0600 **F:** +64 4 529 0601

Christchurch Science Centre
27 Creyke Road, Ilam, Christchurch 8041
PO Box 29181, Christchurch 8540
New Zealand
T: +64 3 351 6019 **F:** +64 3 351 0010

www.esr.cri.nz