Trends and Insights Report

Updated 29 July 2022

This report is classified as "in confidence" and should only be distributed beyond the intended recipients on a need-to-know basis.

Purpose of report

This report comments on national and regional quantitative trends in the New Zealand COVID-19 pandemic, including infections, diagnosis, hospitalisations and mortality. It also comments on international COVID-19 trends and the latest scientific insights related to outbreak management. The report relies on data that may be subject to change or is incomplete.

Key insights

Infection Trends

- Nationally, the weekly case rate was 12.0 per 1,000 population for the week ending 24 July. This is a 12.4% decrease from the previous week, which was 13.7 per 1,000.
- For the week ending 24 July, estimates suggest that 2.4% (816/33,511) of healthcare workers (HCW) tested positive. HCW have a similar risk of infection to the general community, as they are more likely to be infected in the community than in their workplace due to strict infection prevention and control measures.
- Comparisons of case rates in HCW to general community indicate a minimum of 50% of community infections are not being reported.
- Levels of viral RNA in wastewater have declined in the past weeks. However, this decline is not substantial.
- In the past week, 17 out of 18 Districts experienced an decrease in case rates.

Demographic Trends in Case Rates

- The lowest case rate continues to be in Pacific Peoples (6.8 per 1,000); case rates in this group have decreased by 2.2% in the past week. Māori case rates have also decreased and are now at 8.0 per 1,000.
- For the 65+ age group, case rates in the Northern region decreased by 8.6%, Te Manawa Taki decreased by 15.8%, Central decreased by 12.4% and Te Waipounamu decreased by 10.3% in the past week.
- Case rates for those at higher risk of complications or severe illness from COVID-19, for those aged 45-64 and those aged 65+, were highest in European or Other with the 45-64 age group at 16 per 1,000 and 65+ age group at 14.3 per 1,000.

Whole Genomic Sequencing

- Omicron BA.5 was the dominant subvariant accounting for about 70 % of sequenced community cases in the past week.
- This week, watchlist variants (BA.4 and BA.5) were again detected in community samples and wastewater data detected BA.4/5 at all sites. The rise of the BA.5 variant of Omicron is a key observation – it is estimated to make up 90% of cases in the next week.

- It is likely that BA.5 is largely responsible for the current national increase in case rates.
- As of 24 July, ESR received samples from and had processed 238 of the 738 PCR positive hospital cases with a report date in the two weeks to 22 July 2022. Of these, 19% had a BA.2 genome, 14% were BA.4, and 66% were BA.5.

Border Surveillance

- In the week ending 17 July, there were 62,119 border arrivals, of whom 88% (56,276) uploaded a RAT result upon arrival. This is similar to 88% in the week prior.
- In the week ending 17 July, 4.4% of recent arrivals tested positive via RAT, a decrease from 4% in recent weeks.
- Cases in border arrivals rose sharply after 20 June and are approaching a new steady state. By 25 July, there were more than 400 reports per day. While the increase is sudden, it is in line with expectations following the removal of pre-departure testing from 20 June and is still low compared to cases acquired in the community.
- The percentage of PCR positive border arrivals with WGS complete was 19%. This figure is quite low, however, it is expected to rise as more of the recent cases are processed. In the previous three months, this figure was between 40% and 70%.
- The number of samples available for genomic sequencing has decreased in the last week but the target required for good detection of new variants (300 per week) was still met.

Hospitalisation and Mortality

- For the week ending 24 July, the national daily average hospital occupancy for inpatients with COVID-19 was 15.1 per 100,000 population, an increase of 6.1% from the week prior. Hospital occupancy average rates increased across all regions except Northern in the past week. The Northern region (14.3 per 100,000) decreased by 5.7%, Te Manawa Taki (14.4 per 100,000) increased by 23%, Central region (15.3 per 100,000) stayed the same in the past week and Te Waipounamu (16.9 per 100,000) increased by 23%.
- As of 28 July 2022, there were 2,056 deaths with COVID-19 infection who died within 28 days of being reported as a case and/or with COVID-19 being the primary cause of death.
- Of the deaths that have been reviewed, 48% had COVID-19 as the main underlying cause, and COVID-19 contributed to 26% of deaths. The remaining 26% were found to be due to unrelated causes, such as accidents.

International and Scientific Insights

- Globally, in the week ending 24 July 2022, the number of weekly cases increased, with 6.6 million new cases reported after an increasing trend for the past five weeks.
- The number of new weekly deaths is increasing with 12,600 deaths reported.
- Globally, from 21 June to 21 July 2022, 193,561 SARS-CoV-2 sequences were collected and submitted to GISAID. The Omicron VOC remains the dominant variant circulating, accounting for 90.1% (176,140) of sequences.
- A comparison of sequences submitted to GISAID in the week ending 16 July and the week ending 9 July shows a decline in BA.2 sequences from 3.6% to 2.2% and a decline in BA.2.12.1 sequences from 6.4% to 2.7%. Within the same period, the proportion of reported sequences of BA.4 increased from 11.1% and 11.2% and BA.5 decreased from 52.4% to 52%.

- BA.2.75 is an Omicron subvariant under monitoring by the WHO, with earliest sequences reported from May 2022. As of 18 July, 250 sequences of BA.2.75 from 15 countries have been reported to GISAID.
- The scientific insights section includes studies on outbreak management, economic evaluations, transmission dynamics and modelling studies.

Health System Capacity

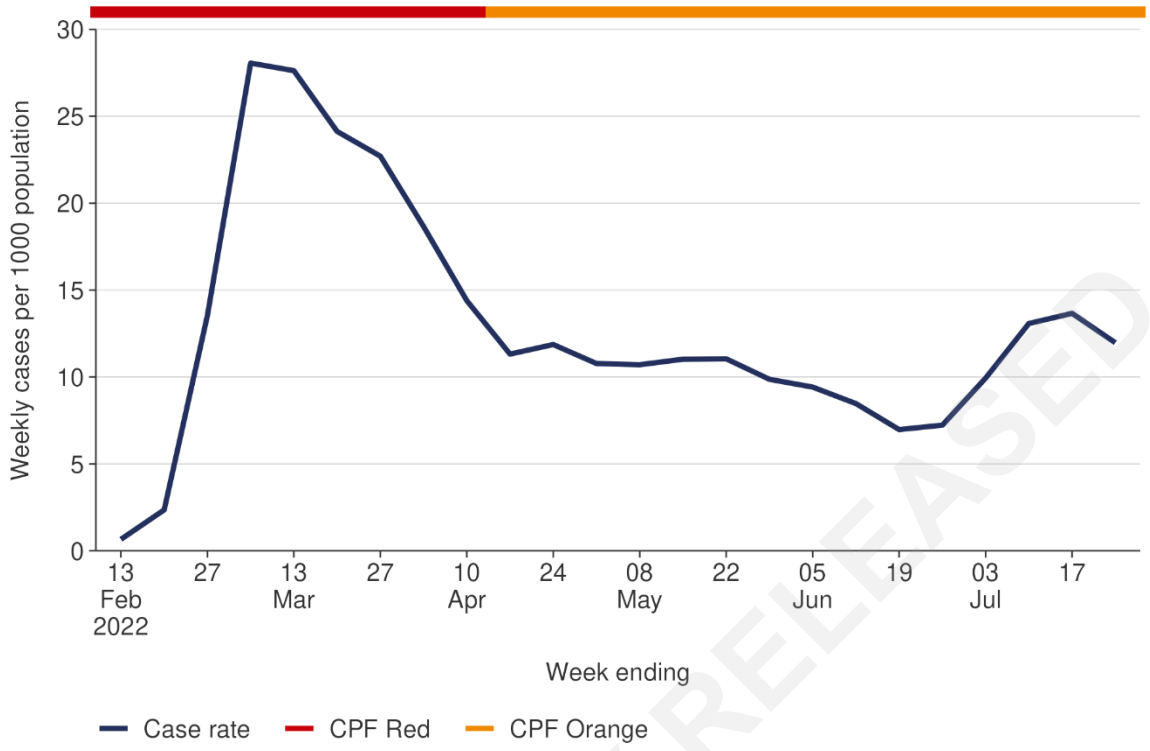
- There continues to be reports of staff working long hours, for extended periods. Some pharmacies continue to operate for reduced hours.
- *Aged Residential Care:* As at 19 July, 4% of ARC facilities had at least one COVID 19 case. A record 755 cases were reported in ARC facilities on July 12. This has reduced to 649 as at 25 July.
- *Pacific Health providers:* There is high demand for food parcels and many are experiencing workforce shortages due to winter illnesses.
- *Home & Community Care:* We continue to see a reduction in total numbers of employees compared with October to December last year (9% decline) and a decline in total services delivered compared with October to December last year (5% decline).
- *Emergency Departments:* An increase in number of patients staying 7 days or more, combined with high numbers of COVID 19 cases in hospital is impacting flow through ED and hospitals nationally. Five day rolling average of ED presentations was elevated in late June but has decreased slightly in July. The number of patients who are seen and treated within 6 hours in ED continues to decline.
- *Workforce:* Clinical absenteeism is consistently between 10-15% in all regions.

Domestic epidemic outlook

Infection outlook

- NZ was in COVID Protection Framework Red from the start of the year until 14 April 2022 when it moved to Orange, where it continues to be (**Figure 1**). The rate of decline for cases slowed after the week ending 17 April, after which a plateau with a slight decline to the week ending 19 June was observed.
- Community cases have increased for the past four weeks but tapered in the past two weeks with a decrease of 12.4% from the previous week.
- Comparisons of community cases against routine worker testing indicate a substantial under-ascertainment, with approximately half of community cases likely not reported.
- Wastewater quantification levels have also declined slightly and are close to the levels during the March peak across the motu, supporting the trend in case rates. However, the decrease in wastewater is not substantial as 66% of sites across the motu are still higher than a month ago.
- Case rates across all age groups have declined slightly over the past week with rates among cases aged 65+ also declining by 11.4%.
- These trends continue to be driven by Omicron subvariant BA.5. Models predict BA.5 will reach 90% of all community cases in early August.
- Due to the overlapping impacts of immune evasion characteristics of BA.5, changes in adherence to public health measures, and infections moving into previously protected communities at high risk of infections, continued substantial increases in infections are likely in the coming weeks.
- It is possible that the current slowdown of case rates is due to the school holidays and a reduction of mixing that is affecting testing behaviour and transmission.
- Hospitalisations increased by 6% and it is highly likely both infections and hospitalisations will continue to increase in the coming weeks.

Figure 1: National weekly case rates and CPF level for 13 February – 24 July 2022



Source: Éclair/Episurv, 2359hrs 24 July 2022

Tertiary Care outlook

- Inpatient test positivity for COVID-19 has increased and is now 54 per 1,000 inpatients in the past week.
- New CMA modelling scenarios predict a sharp rise in hospitalisations from BA.5 becoming the dominant variant in the community, estimated at 800 hospitalisations a day.
- Increasing trends in hospitalisations in the coming weeks are likely to exacerbate poor outcomes for at-risk populations such as those who are older, unvaccinated and/or have co-morbidities.

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Figures

Infection Trends

Summary of evidence for infection and case ascertainment trends

Currently, the healthcare workforce case rates in the past week (24.4 per 1,000) are higher than the general population (12.0 per 1,000). This suggest that the underlying level of infection is substantially higher than diagnosed rates. Case rates in healthcare workers have decreased slightly in the past two weeks compared to the previous three weeks where an increase was observed. These rates are consistent with general population case rates which have also decreased at a slower rate compared to the previous three weeks where they increased. These trends are consistent at a national level across all ethnicities and age groups.

Inpatient test positivity at tertiary hospitals across the motu has plateaued in the last week to 4.6% (46 per 1000) of inpatients testing positive for COVID-19. This could indicate the rate of decrease in infections has slowed in the past week.

Levels of viral RNA in wastewater have declined in all regions, except Te Waipounamu in the past week. However, 66% of sites are still higher than levels observed a month ago. This indicates that there has been no substantial decrease in infections in the community.

EpiNow forecasting indicates the median estimate of effective R (Reff) nationally is 0.9. This means cases are likely to remain at similar levels or decrease in the coming week.

Updated COVID-19 Modelling Aotearoa (CMA) scenarios indicate that, under current public health measures settings, cases will peak at approximately 12,000 cases and 800 hospitalisations daily in early August. However, community trends for cases are tracking lower than the modelled scenario. This may suggest the model scenario was more pessimistic with regard to cases. Models will be updated in next week's report.

Approximation of underlying infection incidence

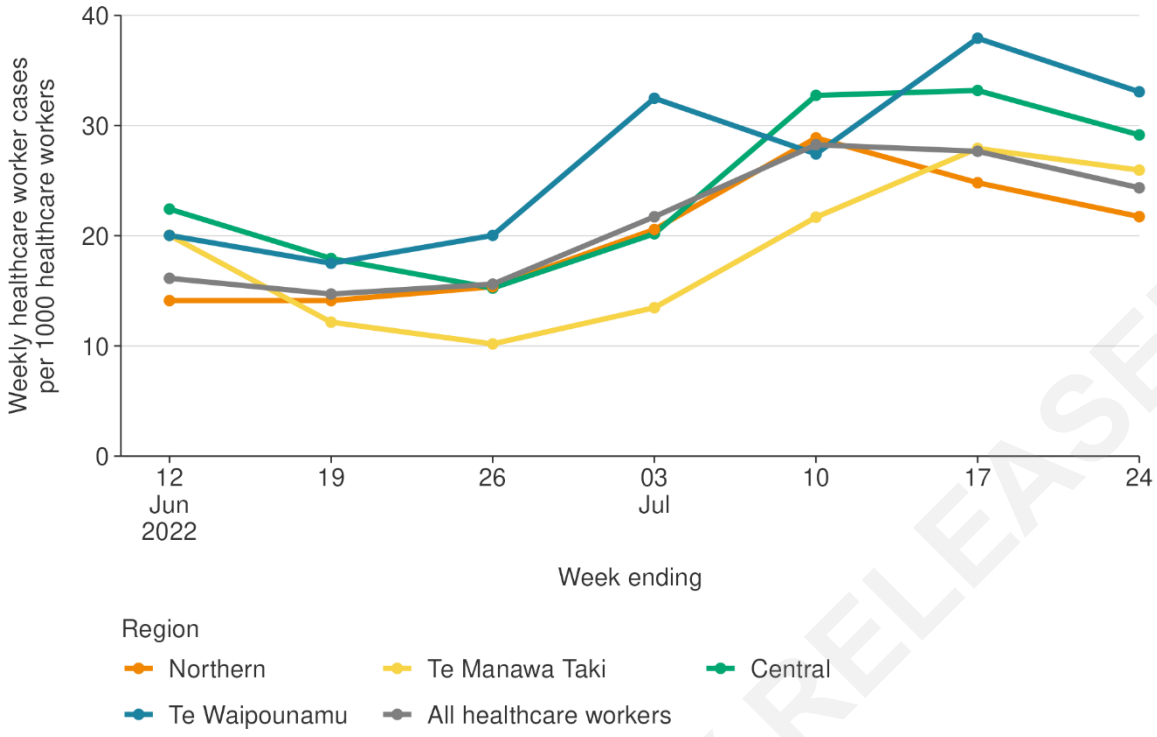
Please note that we have removed data related to Border Worker case rates and testing as the underlying surveillance data is under review due to the end of the legal requirement for routine testing.

Underlying infection incidence has been estimated using case rates for routinely tested healthcare workers where there was evidence of regular testing.[1] While these workers are not a representative sample of New Zealanders, healthcare workers are likely to have a similar risk to the general population as their risk of infection from the community is likely to be much higher than risk faced in their workplace, due to strict infection prevention and control policies.

For the week ending 24 July, estimates suggest that 2.4% (816/33,511) of healthcare workers **(Figure 2**) tested positive (for the first time).

[1] The population has been identified based on surveillance codes used in the healthcare workforce and the presence of previous testing data in 2022. A sensitivity check was run using at least 3 tests and while these numbers reduced, the incidence estimates remained very similar.

Figure 2: Regional weekly case rates of health care workers for weeks 12 June – 24 July 2022

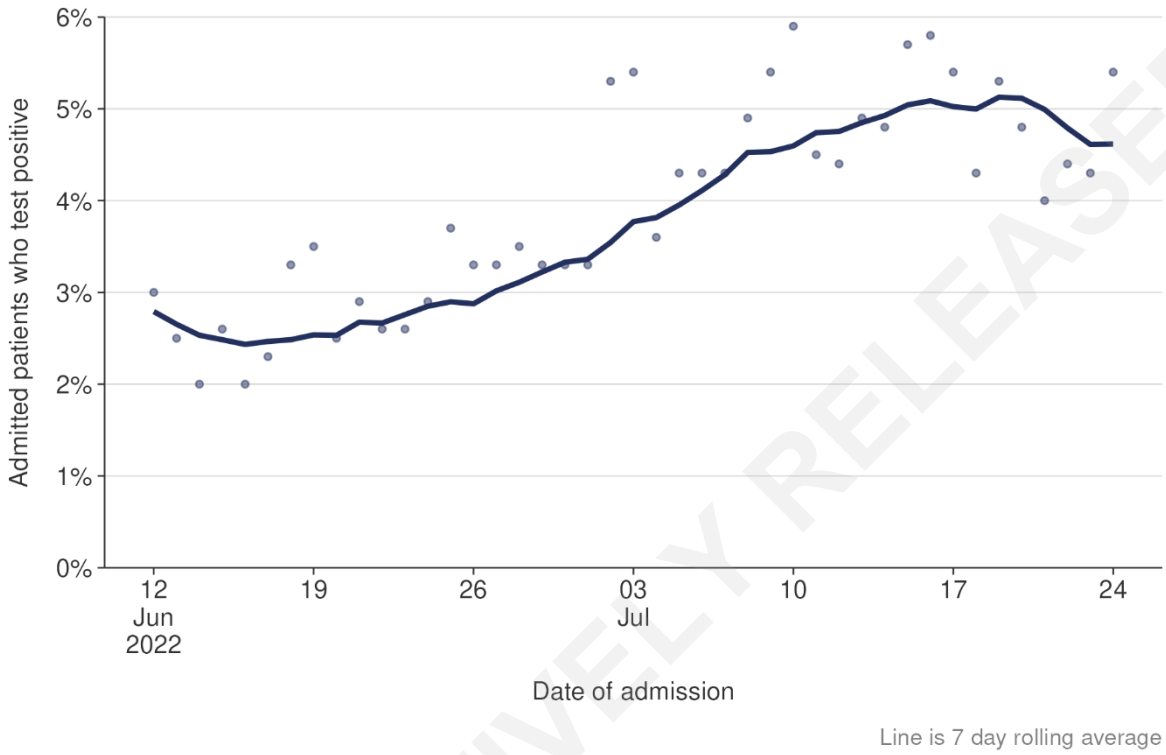


Source: Éclair/Episurv, 2359hrs 24 July 2022

Test positivity trends among tertiary hospital admissions

Inpatient test positivity trends for tertiary hospital admissions[2] is shown in **Figure 3**. Tertiary hospital admission positivity has plateaued with a 7-day rolling average of 4.6% (589/12,758) for the week ending 24 July. Preliminary analysis indicates a large majority of cases who are admitted to hospital,test positive and are confirmed as a case on the day of their hospitalisation.

Figure 3: Percent of tests positive among tertiary hospital admissions



Source: Tertiary hospitalisation data, NCTS & EpiSurv as at 2359hrs 24 July 2022

[2] These are hospital admissions who had COVID at the time of admission or while in hospital. This data is from Districts with tertiary hospitals; these Districts are Auckland, Canterbury, Southern, Counties Manukau, Waikato, Capital & Coast, Waitemata, and Northland.

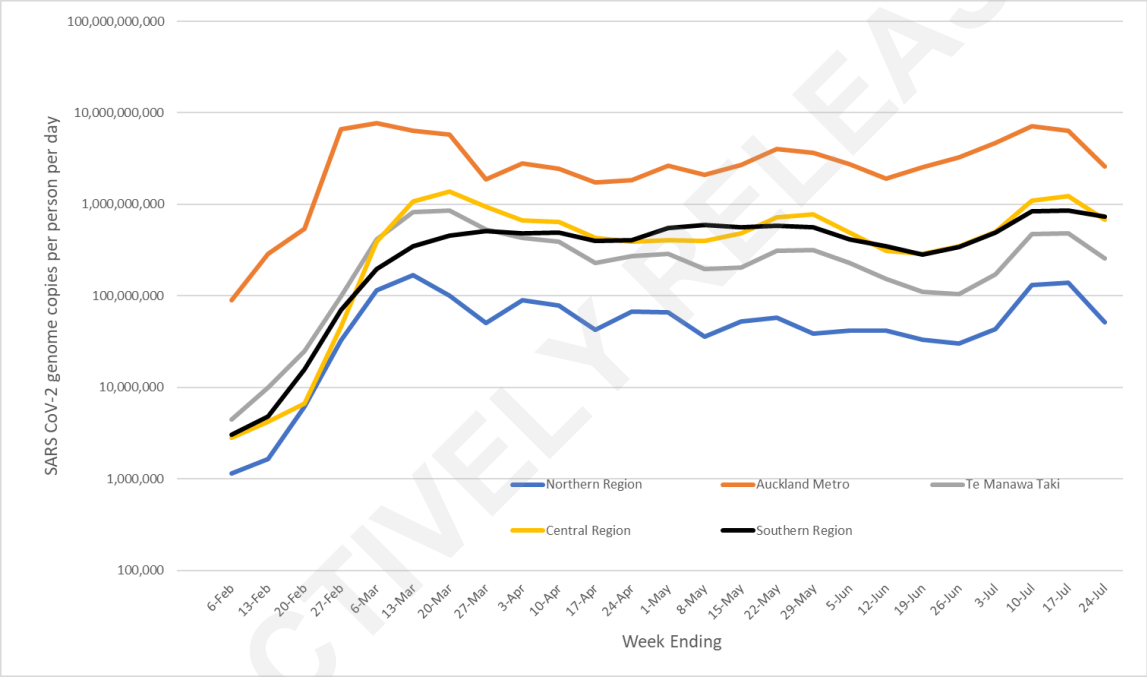
Wastewater quantification

Figure 4 provides an overview of wastewater results by region. Please note that it is not appropriate to compare SARS-CoV-2 absolute levels by region; this figure can only be used to assess the trends *within* each region.

The SARS-CoV-2 RNA levels in wastewater in all regions, except Te Waipounamu, have declined in the previous week. However, the current results are incomplete for the Auckland Metro Region and all results may have been affected by recent heavy rain and flooding events across the motu.

The trends in each catchment area are not necessarily consistent within each region; within-region trends are available in ESR's weekly wastewater report.

Figure 4: Regional wastewater trends in SARS-CoV-2 genome quantification (2-week rolling average) for weeks 06 February – 24 July 2022



Source: ESR SARS-CoV-2 in Wastewater update for week ending 24 July 2022

Trends in diagnosed cases

Overall, the weekly case rate was 12.0 per 1,000 population for the week ending 24 July. This is a 12.4% decrease from the previous week, which was 13.7 per 1,000.

Figure 5 shows that case rates have decreased across all regions in the past week. The Northern region rate (10.2 per 1,000) decreased by 14% in the past week, Te Manawa Taki (9.9 per 1,000) decreased by 9%, Central region (14.6 per 1,000) decreased by 11% and Te Waipounamu (14.7 per 1,000) decreased by 13%.

In the past week, 17 out of 18 Districts experienced an decrease in case rates. There was a 7% decrease in Counties Manukau, a 3% decrease in Northland, a 5% increase in Taranaki, a 8% decrease in Lakes, a 17% decrease in Bay of Plenty, a 8% decrease in Waikato, a 28% decrease in Hawke's Bay, a 14% decrease in Wairarapa, a 13% decrease in Whanganui, a 13% decrease in MidCentral, a 14% decrease in Southern, a 13% decrease in Canterbury and West Coast, a 5% decrease in South Canterbury, a 12% decrease in Nelson Marlborough.

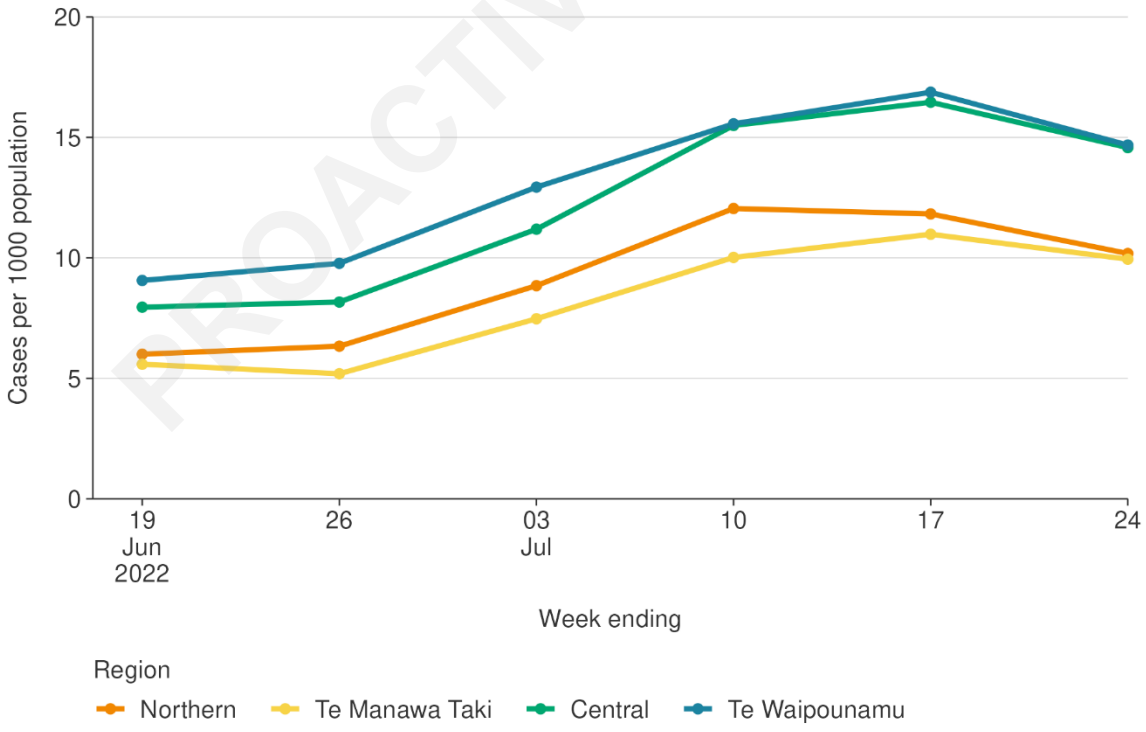
In the Northern region, the weekly case rate was highest for Waitematā (10.9 per 1,000) followed by Auckland District (10.7 per 1,000).

In Te Manawa Taki, weekly case rates were highest in Taranaki (12.3 per 1,000), followed by Lakes District (11.4 per 1,000).

The highest weekly case rates in the Central region were in Wairarapa (15.6 per 1,000) followed by Capital, Coast and Hutt Valley (15.3 per 1,000.

In Te Waipounamu, the highest case rates were in Southern District (15.4 per 1,000) followed by Canterbury and West Coast (15.2 per 1,000).

Figure 5: Regional weekly case rates for weeks 19 June – 24 July 2022



Source: NCTS/EpiSurv as at 2359hrs 24 July 2022

Reinfection

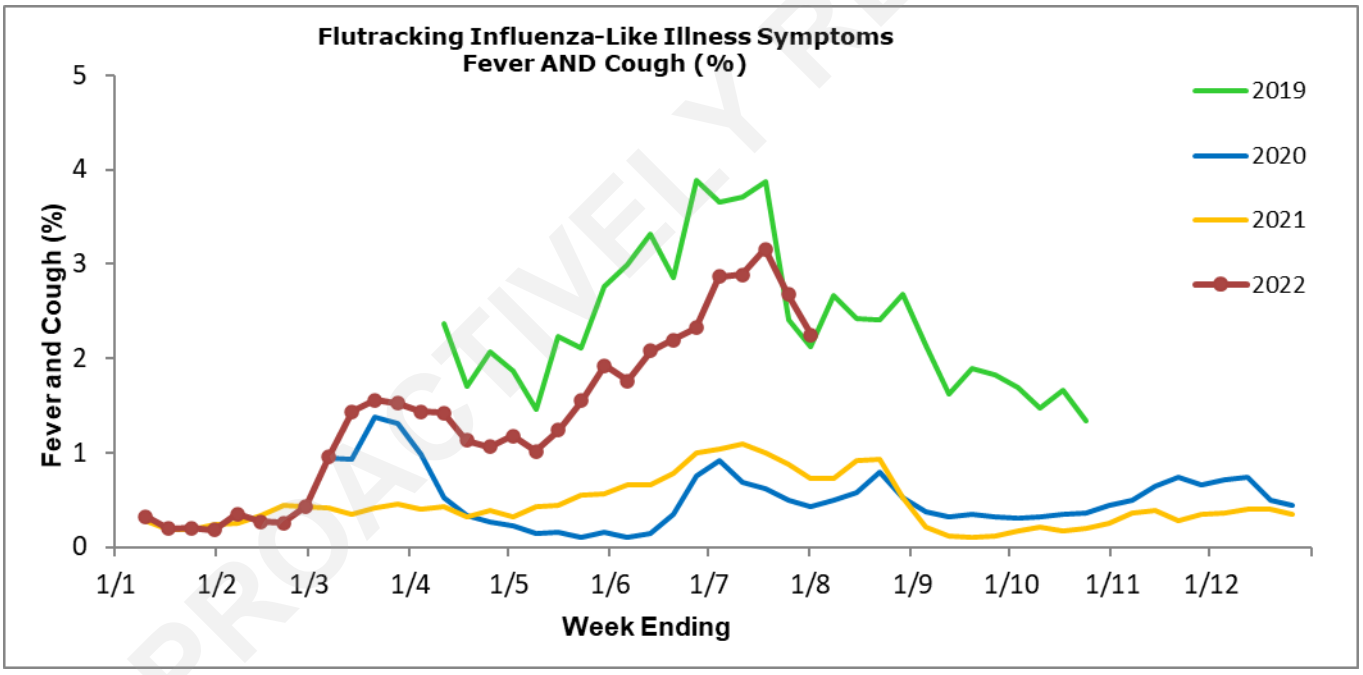
Analysis and interpretation of reinfection data is being developed and will be provided in the next report.

It is important to note that these data come with several significant limitations: (1) Reinfections can only be identified if the previous infection was also reported. (2) Guidance on when to test after first infection was changed on June 30 prior to which the guidance was not to test until 90 days after first infection. This is now 28 days and, consequently, early reinfections were under-reported prior to June 30. (3) Those who have already had a first infection may be less likely to test during their second infection. (4) Reinfections are possibly more likely to be mild or asymptomatic.

Trends in Influenza-like Illness symptoms

Figure 6 shows self-reported FluTracking of Influenza-like Illness (ILI) symptoms. Percentage of fever and cough is trending above what was reported in 2020 and 2021 but just below what was reported for 2019. These data capture symptoms of fever and cough that are similar to all upper respiratory viral infections such as COVID-19, influenza and respiratory syncytial virus (RSV). The reason for this is to track community symptoms of ILIs. However, this data is affected by severity and selection bias.

Figure 6: FluTracking Influenza-like illness symptoms



Source: Weekly FluTracking Report for week ending 17 July 2022

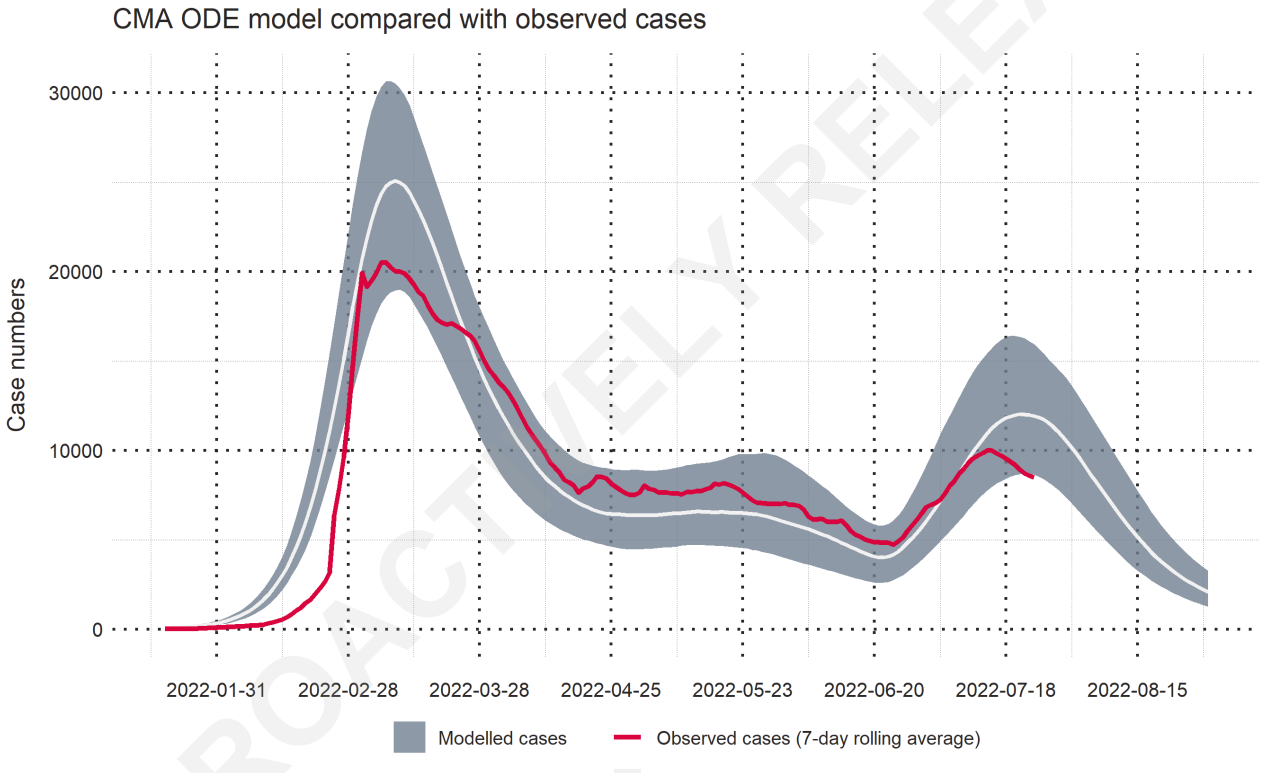
Modelled and actual cases

The COVID-19 Modelling Aotearoa (CMA) group compare predictive model scenarios for number of reported cases with actual number of cases. Figure 7 compares cases with the latest modelling scenario. The white line is the median prediction and grey areas indicate the upper and lower ranges of the prediction.

This is a new scenario that assumes that previous infection provides greater protection against reinfection and severe disease, consistent with emerging international evidence. It also, incorporates updated data and future projections of uptake of second boosters, and an earlier transition to BA.5, consistent with the timing of cases and hospitalisations in New Zealand.

The peak was projected to occur around the middle of last week with daily cases rising to approximately 12,000 a day, however the actual peak was slightly earlier and cases seem to now be declining; slightly earlier than predicted. Case numbers are currently tracking to the lower bound of the model prediction.

Figure 7: COVID-19 Modelling Aotearoa scenarios compared with reported cases nationally (BA.5 scenarios)



Sources: COVID-19 Modelling Aotearoa Branching Process Model July 2022, and Ministry of Health reported case data 24 July 2022

Effective reproduction rate, and forecasts of cases and infections

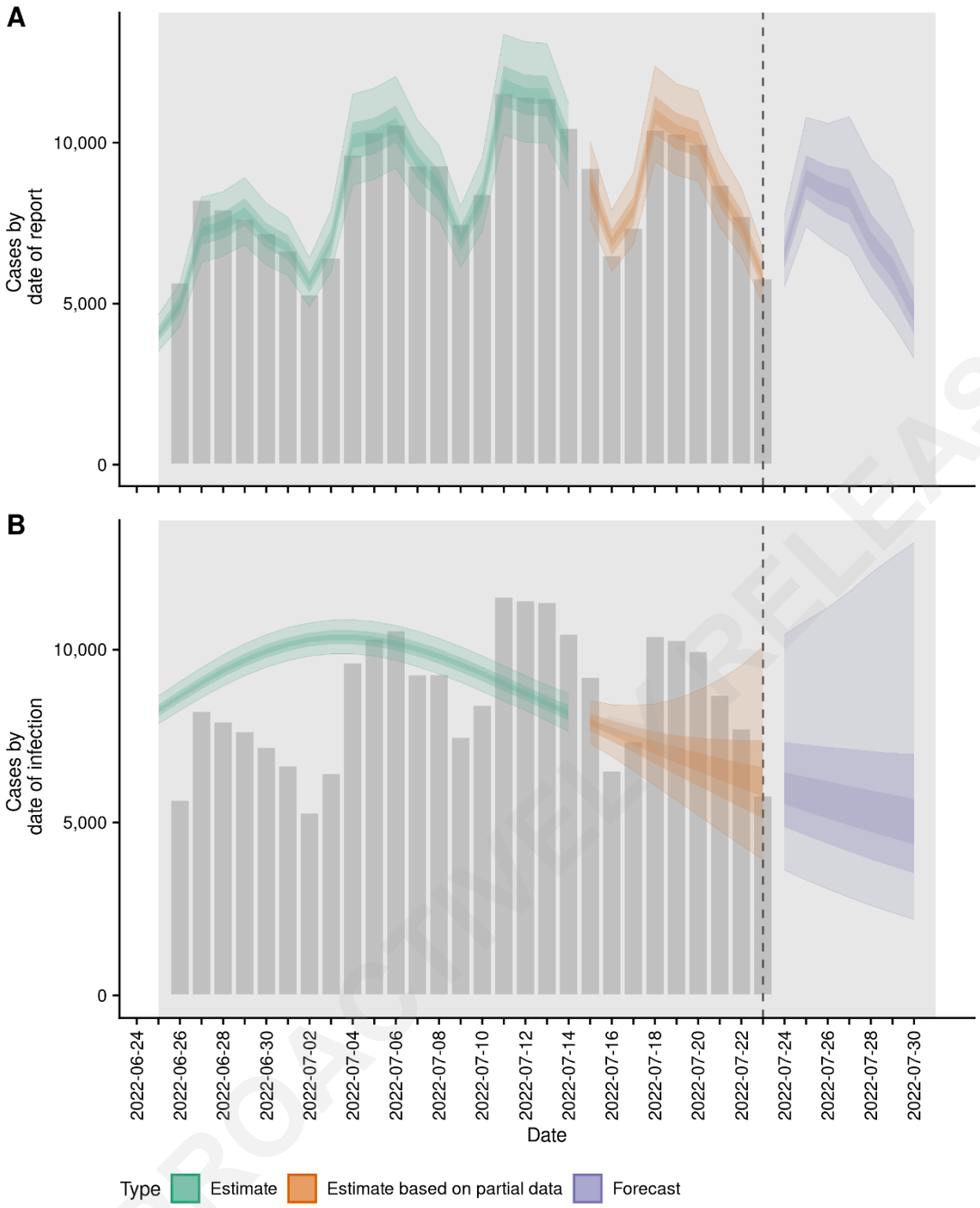
These estimates used the EpiNow package on 26 July using data to 23 July[3]. The median estimate of **effective R (Reff) nationally is 0.9** (90% Credible Interval [CI]: 0.7-1.2) for cases to 23 July, after adjusting for data lags; this is below the previous two weeks. The confidence interval indicates a low to moderate level of uncertainty for this estimate.

Figure 8 compares the previous week's model median estimate for 23 July 2022 of 5,772 cases per day, with a 50% credible interval of 4,898 – 6,826, to the actual reported cases of 7,746. This was a large underestimatation, with the actual number being well outside of the 50% credible interval**, suggesting that there has been an unexpected increase in transmission**.

The model's median estimate is that national reported cases could be 4,700 cases per day by 30 July (50% credible interval: 4,059 – 5,490). However, the credible intervals for the projected cases would be even wider if the possibility of continuing trend changes in effective R were included.

[3] The EpiNow package 'now-casts' and forecasts cases to measure current, past and future transmission nationally by calculating and then extrapolating the effective reproduction number, Reff. The model does not consider several factors that may impact transmission, such as rapid changes in public health measures, population behaviour, mobility, or school holidays. This model requires sustained daily cases before it can make predictions. It only counts cases that become confirmed at some stage.

Figure 8: Projected national cases by (A) date of report and (B) date of infection



Source: EpiNow 23 July 2022, based on NCTS and EpiSurv cases

Demographic trends in case rates

Ethnicity trends over time and by region

Figure 9 shows national case rates by ethnicity. **Figure 11** shows regional case rates by ethnicity.

In the past week, case rates witnessed a plateau or slight decrease for all ethnicities after steady increases in the past month. Rates in Asian and European or Other ethnicities remain higher than those for Māori and Pacific Peoples. European or Other continue to have the highest weekly case rate at 13.4 per 1,000 (down from last week's 15.6 per 1,000), followed by Asian at 12.4 per 1,000 (down from 13.8 per 1,000 last week). The lowest case rate continues to be in Pacific Peoples (6.8 per 1,000), which is a 2.2% decrease from last week (7.0 per 1,000). The Māori case rate has also decreased by 6.5%, from 8.5 per 1,000 in the previous week to 8.0 per 1,000.

Case rates in the Northern region for European or Other were 11.2 per 1,000 and rates for Asian were 11.6 per 1,000. Māori had the second lowest case rate at 7.2 per 1,000. Pacific Peoples (6.4 per 1,000) had the lowest case rates in this region.

Case rates for Te Manawa Taki were highest for European or Other (11.2 per 1,000), followed by Asian (11.1 per 1,000). Pacific Peoples had the second lowest case rate at 6.6 per 1,000 followed closely by Māori who had the lowest case rates at 6.7 per 1,000.

In the Central region, case rates were highest for European or Other (16.5 per 1,000), compared to Asian (13.3 per 1,000). Māori had the second lowest case rate at 9.8 per 1,000 and Pacific Peoples had the lowest case rate at 8.3 per 1,000.

Case rates for Te Waipounamu were highest for Asian (16.4 per 1,000) and European or Other (15.2 per 1,000). Māori had the second lowest case rate at 10.1 per 1,000 and Pacific Peoples had the lowest case rates at 8.0 per 1,000.

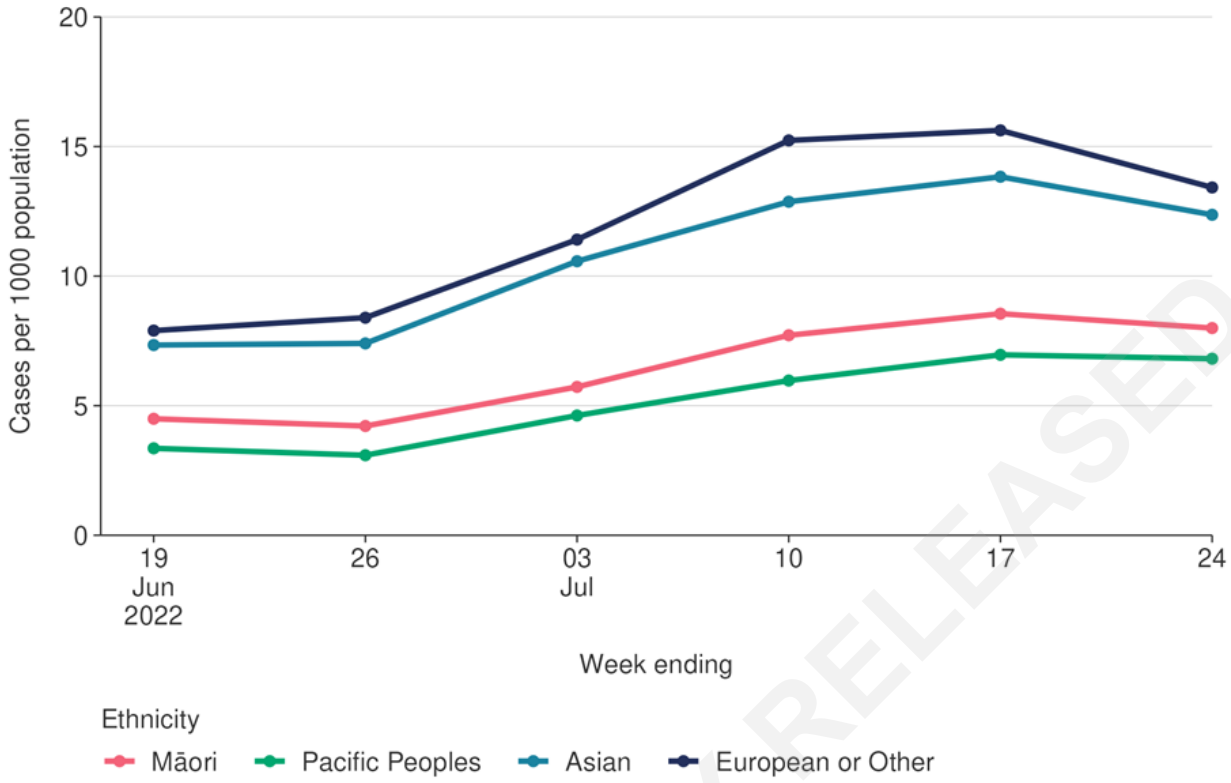
Figure 10 shows national case rates by ethnicity and a further breakdown by age group. The highest case rates out of any cohort were within those aged 45-64 of European or Other and 25-44 of Asian ethnicity (16.0 and 15.1 per 1,000 respectively) whilst the lowest case rates were in those aged 0-4 and 5-14 of Pacific Peoples ethnicity (3.0 and 3.1 per 1,000 respectively). For both Māori and Pacific Peoples, case rates were highest in the 25-44, 45-64 and 65+ age groups. For Asian people, case rates were highest in the 15-24, 25-44 and 45-64 age groups. For European or Other, case rates were highest in the 25-44, 45-64 and 65+ age groups.

Cases rates for all ethnicities aged 65+ decreased except Asian Peoples in the past week. In the week ending 24 July, case rates for Asian aged 65+ were 10.3 per 1,000 (4% increase from week prior). Case rates for European or Other aged 65+ were 14.3 per 1,000 (13% decrease from week prior). Case rates in Māori aged 65+ were 12.2 per 1,000 (2% decrease from week prior). Case rates in Pacific People aged 65+ were 9.6 per 1,000 (2% decrease from week prior).

Case rates for those at higher risk of complications or severe illness from COVID-19, for those aged 45-64 and those aged 65+, were highest in European or Other (45-64 at 16.0 per 1,000 and 65+ at 14.3 per 1,000).

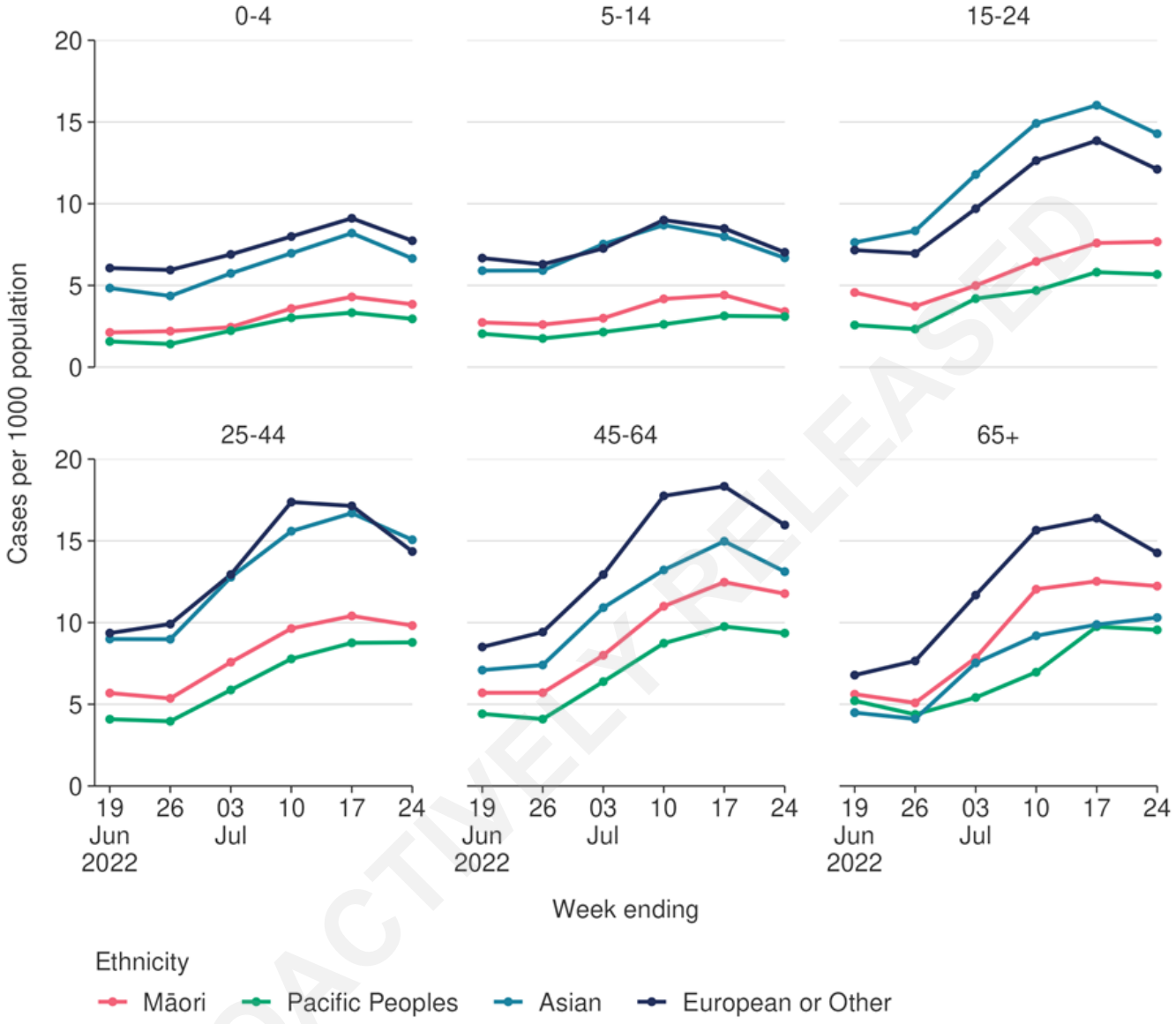
As Māori and Pacific Peoples have lower life expectancies than other ethnicities in Aotearoa New Zealand, they are likely to have a higher risk for COVID-19 complications at a younger age than other ethnicities.

Figure 9: National weekly case rates by ethnicity for weeks 19 June – 24 July 2022



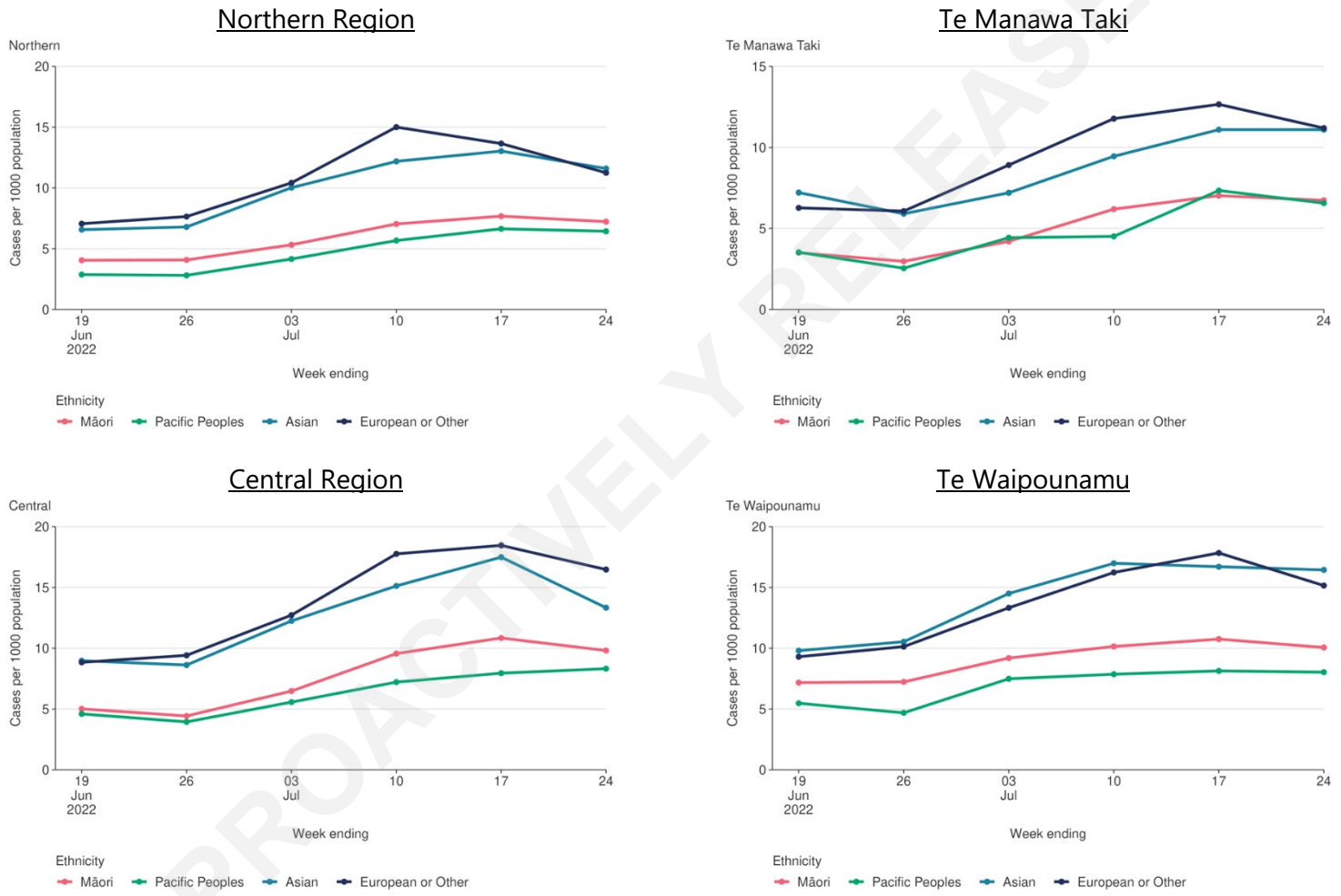
Source: NCTS/EpiSurv as at 2359hrs 24 July 2022

Figure 10: National ethnicity-specific weekly case rates by age group for weeks 19 June – 24 July 2022



Source: NCTS/EpiSurv as at 2359hrs 24 July 2022

Figure 11: Regional weekly case rates by ethnicity for weeks 19 June – 24 July 2022



Source: NCTS/EpiSurv as at 2359hrs 24 July 2022

Age trends over time and by region

Figure 12 shows community cases by age nationally. Case rates have decreased across all age groups in the past week. Nationally, case rates in the 65+ age group decreased 11.4% from last week, to 13.6 per 1,000.

Nationally, case rates were relatively similar for 0-4 and 5-14 age groups (6.1 and 5.7 per 1,000 respectively). The case rate for the 15-24 age groups was 10.8 per 1,000; The 25-44 age group had the second highest case rate at 13.5 per 1,000; The 45-64 age groups had the highest case rates at 14.8 per 1,000 in the past week; Those aged 5-14 had the lowest weekly case rate at 5.7 per 1,000.

For the 0-4 age group, case rates in the Northern region decreased by 15.5%, Te Manawa Taki decreased by 10.1%, Central increased by 19.6% and Te Waipounamu decreased by 11.9%.

For the 5-14 age group, case rates in the Northern region decreased by 11.0%, Te Manawa Taki decreased by 14.1%, Central decreased by 24.3% and Te Waipounamu decreased by 20.5%.

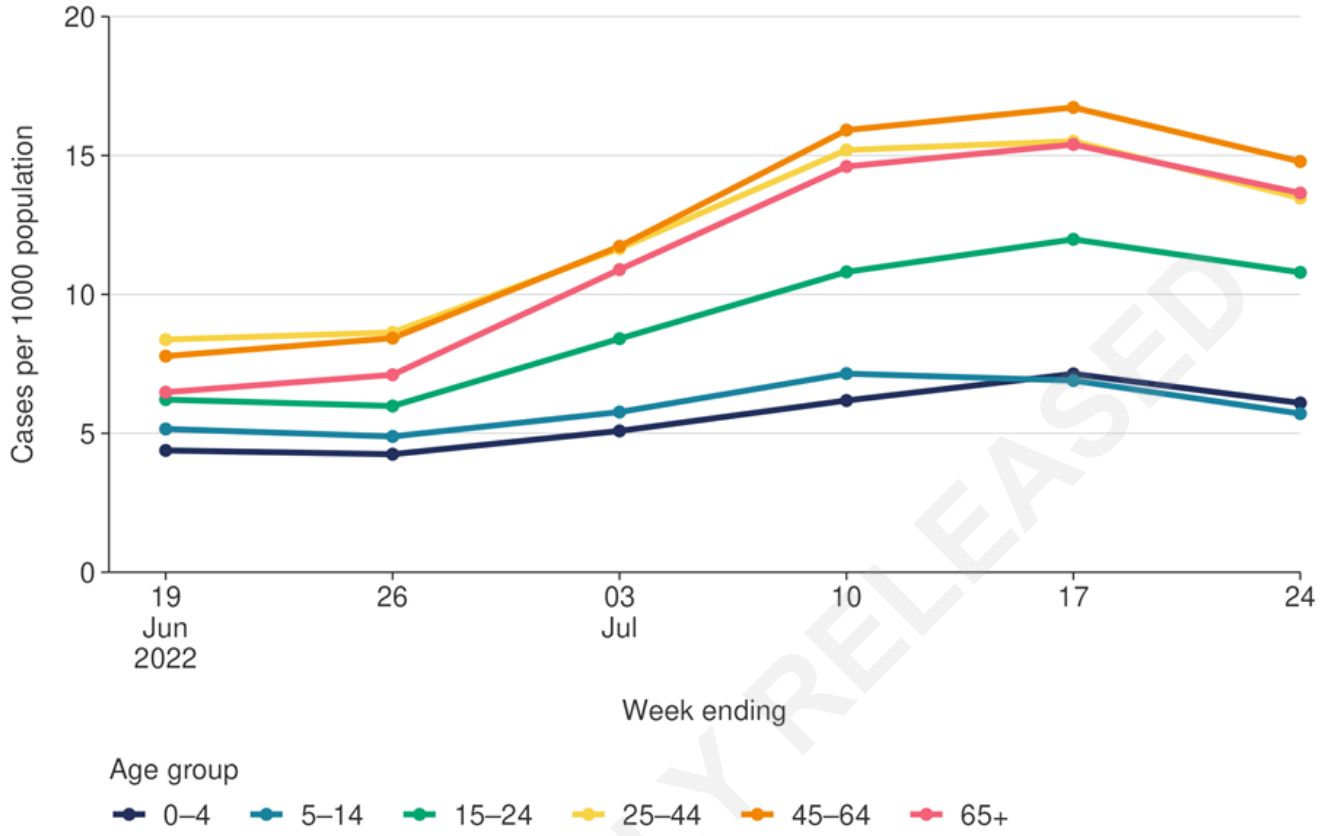
For the 15-24 age group, case rates in the Northern region decreased by 15.6%, Te Manawa Taki decreased by 3.2%, Central decreased by 14.8% and Te Waipounamu decreased by 1.5%.

For the 25-44 age group, case rates in the Northern region decreased by 13.8%, Te Manawa Taki decreased by 7.6%, Central decreased by 9.1% and Te Waipounamu decreased by 18.4%.

For the 45-64 age group, case rates in the Northern region decreased by 16.2%, Te Manawa Taki decreased by 7.4%, Central decreased by 8.2% and Te Waipounamu decreased by 11.7%.

For the 65+ age group, case rates in the Northern region decreased by 8.6%, Te Manawa Taki decreased by 15.8%, Central decreased by 12.4% and Te Waipounamu decreased by 10.3%.

Figure 12: National weekly case rates by age for weeks 19 June – 24 July 2022



Source: NCTS/EpiSurv as at 2359hrs 24 July 2022

Deprivation trends over time, by ethnicity and by region

Figure 13 shows case rates based on the NZDep2018.[4] Deprivation is a structural determinant of COVID-19 both in terms of risk of infection and poor outcomes. Areas of high deprivation are ones where there is poor access to the internet, low incomes, higher number of welfare recipients, increased unemployment, single parent families and higher prevalence of people living in rented accommodation and/or in homes that are overcrowded and damp. These factors impact the ability to sustain self-isolation for cases and their household members.

Overall, in the past week, case rates continued to be highest in the least deprived areas (13.9 per 1,000 population), followed by areas of mid-range deprivation (12.6 per 1,000) and most deprived areas (9.7 per 1,000).

Behavioural insights evidence indicates that not knowing where to report RAT results, financial issues from having to isolate, inability to take time off work and not having a place to isolate safely impact the registering of a positive test. These issues could be exacerbated in areas of higher deprivation. Thus, it could be that some of the difference is explained by deprivation-associated bias in case ascertainment; however, data are not available to investigate this. It is also feasible that lower case rates in areas of high deprivation could be partially explained by higher infection rates earlier in the year.

Comparison of national case rates of deprivation by ethnicity in the past week for areas most deprived shows that case rates were highest in the European or Other ethnicity followed by Asian ethnicity (12.6 and 11.6 per 1,000 respectively). Case rates in Pacific Peoples were the lowest in every deprivation level, while case rates in European or Other people were the highest in every deprivation level. European or Other had the highest case rates in areas least deprived at 14.4 per 1,000 followed by Asian (12.9 per 1,000).

For the most deprived areas, Māori made up 19.2% of cases, which is less than the proportion of Māori population in deprived areas. The proportion of cases in the most deprived areas for Pacific Peoples was 9.6%, for Asian 15.5% and for European and Other, 55.6%. Following this, 80% of cases in areas of least deprivation were European and Other compared with 13.1% Asian, 5.4% Māori and 1.5% Pacific Peoples.

In the Northern region, case rates were highest in the least deprived areas (11.6 per 1,000 population) followed by areas of mid-range deprivation (11.3 per 1,000) and areas most deprived (7.7 per 1,000).

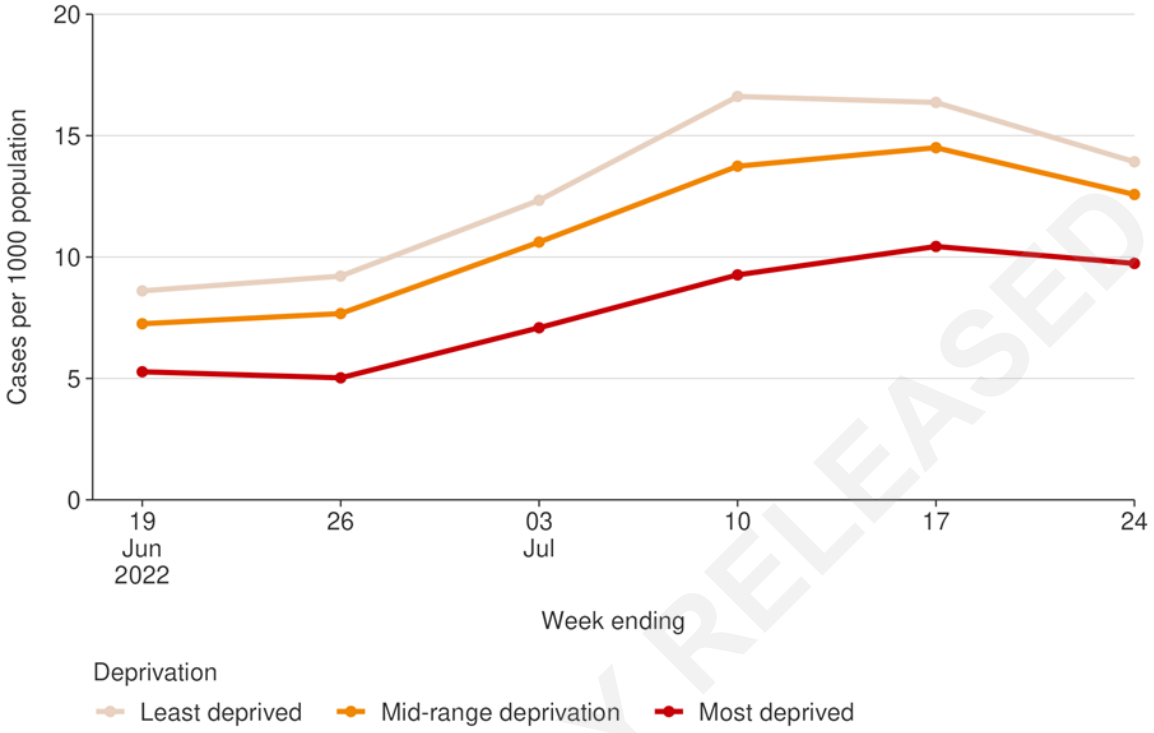
In Te Manawa Taki, case rates were highest in the least deprived areas (11.4 per 1,000) followed by areas of mid-range deprivation (10.5 per 1,000) and areas most deprived (8.9 per 1,000).

In the Central region, case rates were highest in the least deprived areas (17.1 per 1,000) followed by areas of mid-range deprivation (15.1 per 1,000) and areas most deprived (11.8 per 1,000).

In Te Waipounamu, case rates were highest in the least deprived areas (16.0 per 1,000) followed by areas of mid-range deprivation (14.4 per 1,000) and areas most deprived (13.7 per 1,000).

[4] Contents (otago.ac.nz)

Figure 13: National weekly COVID-19 case rates by deprivation status for weeks 19 June – 24 July 2022



Source: NCTS/EpiSurv as at 2359hrs 24 July 2022

Vaccination trends over time

This section has been removed this week.

PCR and RAT testing trends

Since New Zealand entered Phase 3 of the Omicron response, the majority of testing has been by rapid antigen tests (RATs) rather than PCR tests. RATs are self-administered and therefore require the individual to self-report their results, which may result in under-reporting. In addition, RATs are more likely than PCR tests to return a false-positive or false-negative result, especially if used during early periods of infection. On the other hand, increased availability of RATs may mean that more people have tested than would have otherwise had PCR tests continued to be the main surveillance method. Test positivity for RATs would require data on the total number of RATs used, especially negative results. As PCR testing is only used to monitor priority populations and confirm positive RATs in specific situations, these rates and positivity data are not fully representative of the current testing state of New Zealand.

Whole Genomic Sequencing of Community cases

This week, watchlist variants BA.4 and BA.5 were again detected in community samples (first detected in late May/early June). Wastewater data also detected BA.4/5 at all sites in the past week. Wastewater data coupled with community case Whole Genome Sequencing (WGS) results strongly suggests that BA.4/5 are circulating within the wider NZ population. The upward rise of the BA.5 variant of Omicron is a key observation – it is the dominant variant. There is high certainty that BA.5 is largely responsible for the rise in case numbers across the country (and internationally). Models predict it will account for 90% of all community cases in the next week.

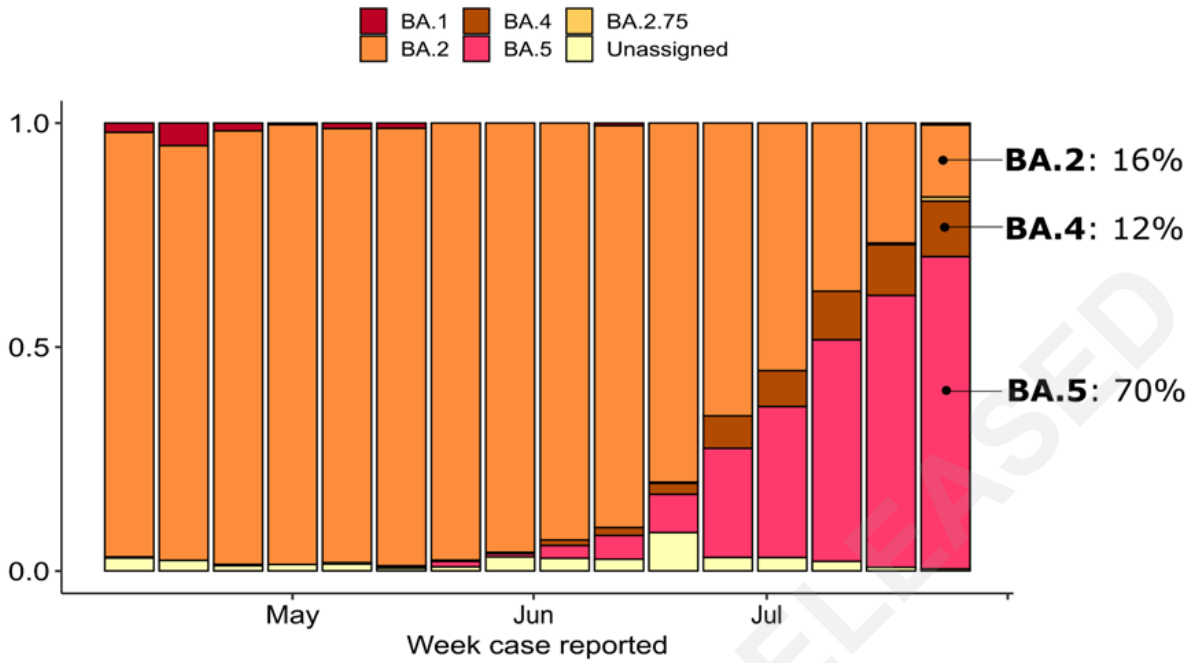
Omicron is the dominant variant in New Zealand having outcompeted Delta, which made up ~70% of all sequenced cases at the start of January 2022 but fell to less than 10% of sequenced cases by the end of January 2022.

Figure 14 shows that BA.5 made up about 70% of sequenced community cases in the past week. **Figure 14** also shows the increasing frequency of BA.5 in community samples over the past few weeks. As expected, in NZ we see a (relative) growth advantage of BA.5 over other variants. BA.4 is holding steady at approximately 12% of community cases.

A recent subvariant BA.2.75 looks to be gaining a global foothold. So far, there have been a small number of reported cases; seven BA.2.75 cases have been reported in the two weeks since 9 July, three border cases and four community. It is probable that small numbers of BA.2.75 are transmitting within the NZ community, but it is unlikely to have a substantial growth advantage compared to BA.5.

Please see the caveats in the Glossary at the end of this document.

Figure 14: Frequency of Variants of Concern in community cases in New Zealand



Source: ESR COVID-19 Genomics Insights Report #15, EpiSurv/Microreact 0900hrs 25 July 2022

Border Surveillance

Cases detected at the Air Border

Imported cases initially increased as travel volumes increased following the first stage of border reopening's in March. Detected cases then remained roughly constant through May and June and began rising again in late June.

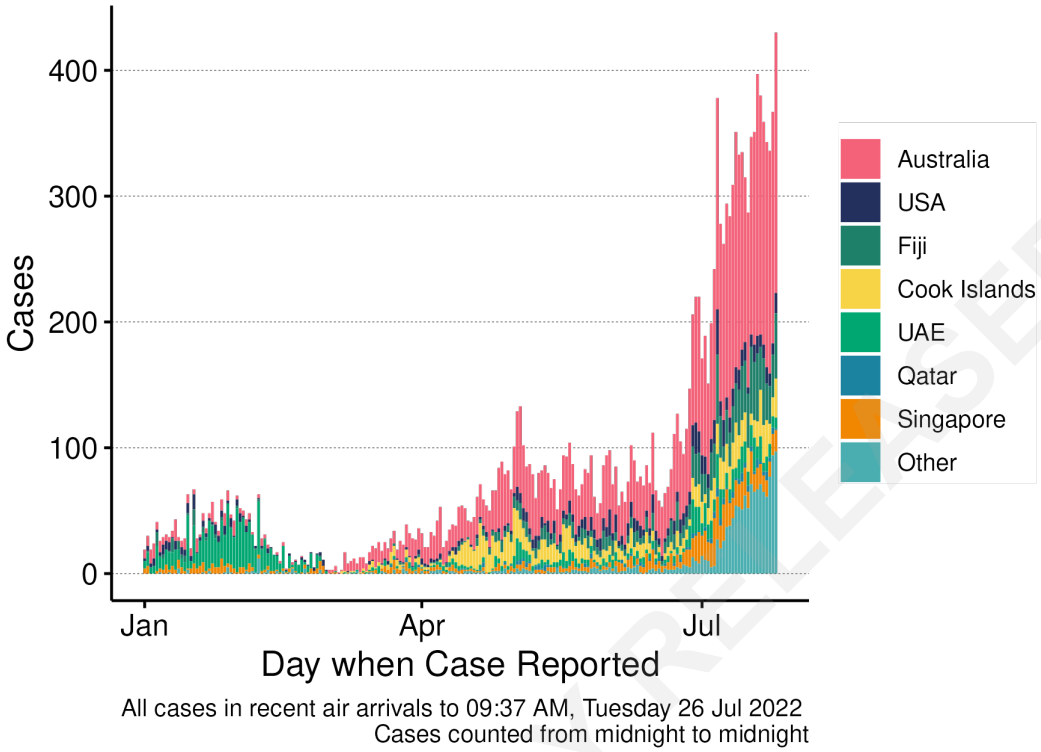
With the removal of pre-departure testing from 20 June, it appears that detected cases have increased from most countries. The increase is consistent with expectations that pre-departure testing halves the number of infected people boarding aircraft, and with increasing Omicron BA.5 prevalence in many source countries. From early July, roughly 4% of recent arrivals are reporting a positive test.

Figure 15 shows the number of RAT-positive cases in arrivals since January 2022. Before Reconnecting New Zealand removed most of the quarantine requirements, most active cases were on the long-haul flights via the United Arab Emirates (UAE). From then until 19 June, while pre-departure tests were required, most cases arrived on flights from Australia followed by the Cook Islands and Fiji, and then the USA. Since 20 June, there has been an increase in cases detected on flights from Australia, Singapore, the Cook Islands and Fiji (**Figure 16**).

Flights from Australia include both short-haul trans-Tasman flights and long-haul flights that transit through an Australian airport. It is no longer possible to accurately track the first country in a multi-stage voyage, as arrival cards are no longer scanned and data in the New Zealand Traveller Declaration system only records countries visited in the weeks before the Declaration is filled in.

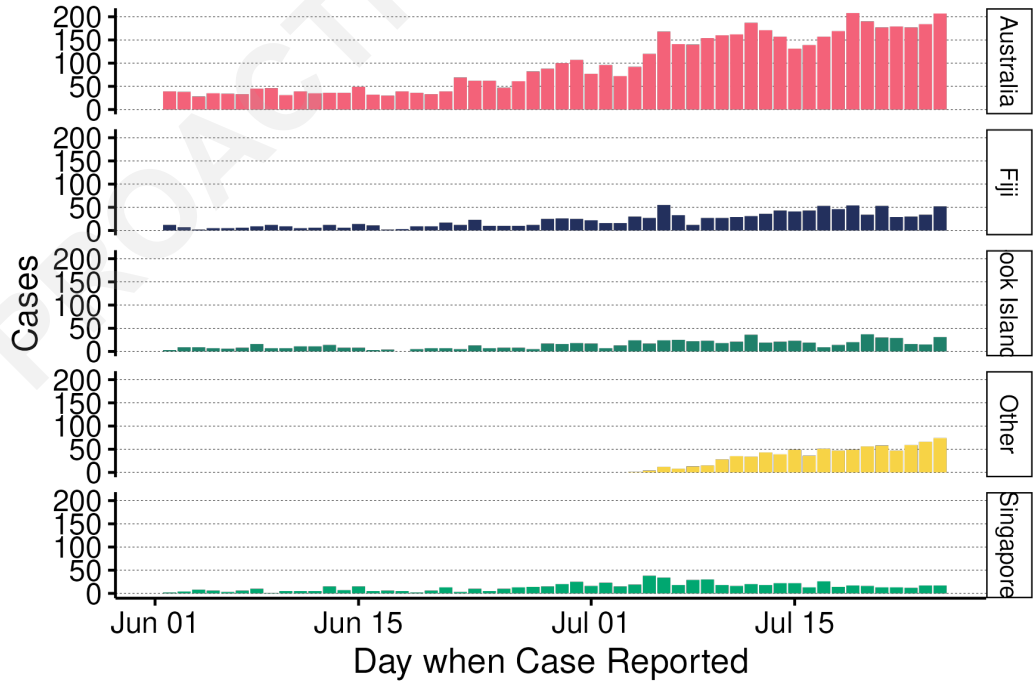
While the increase since 20 June was rapid, it is in line with expectations from the removal of pre-departure testing. Even with this increase, the total number of cases detected at the border is much less than the number reported each day in the community.

Figure 15: Cases reported in post-arrival testing by country of flight departure, 01 January – 25 July 2022



Source: NCTS/EpiSurv as at 2359hrs 25 July 2022

Figure 16: Cases reported in post-arrival testing, by the five flight-departure countries with most cases reported in the seven days to 25 July 2022



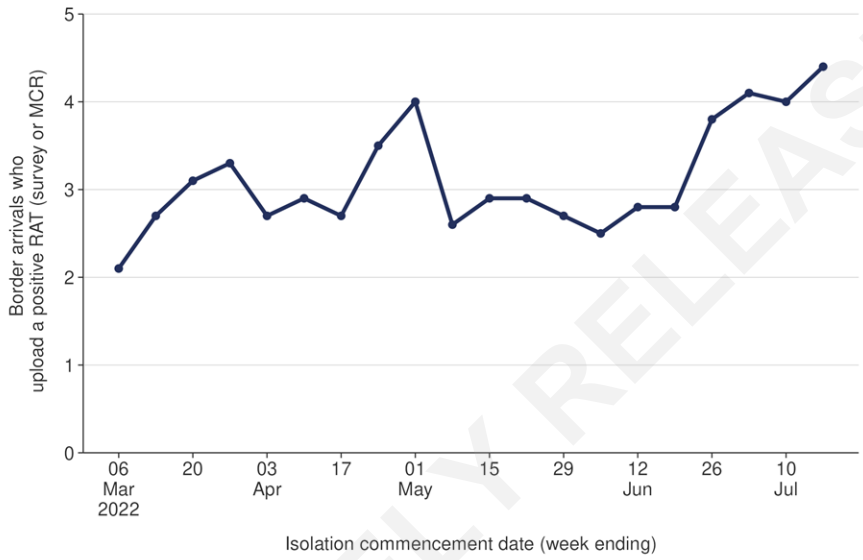
Source: NCTS/EpiSurv as at 2359hrs 25 July 2022

Testing of Border Arrivals

Figure 17 shows that the percentage of positive RATs in border arrivals who reported a test was mostly between 2 – 4.4% for the period 6 March – 17 July 2022. From early May to the week ending 19 June, the percentage of border arrivals returning positive RATs through either the survey or My COVID Record had been holding steady between 2% and 3%. In the past month this figure has surpassed 4%. The percentage of border arrivals returning positive RATs was 4.4% (2,755 of 62,119 arrivals) for the week ending 17 July.

Rates have risen as expected since 20 June, when the requirement for pre-departure tests were removed.

Figure 17: Percentage of positive tests in border arrivals who report RATs, 6 March – 17 July 2022



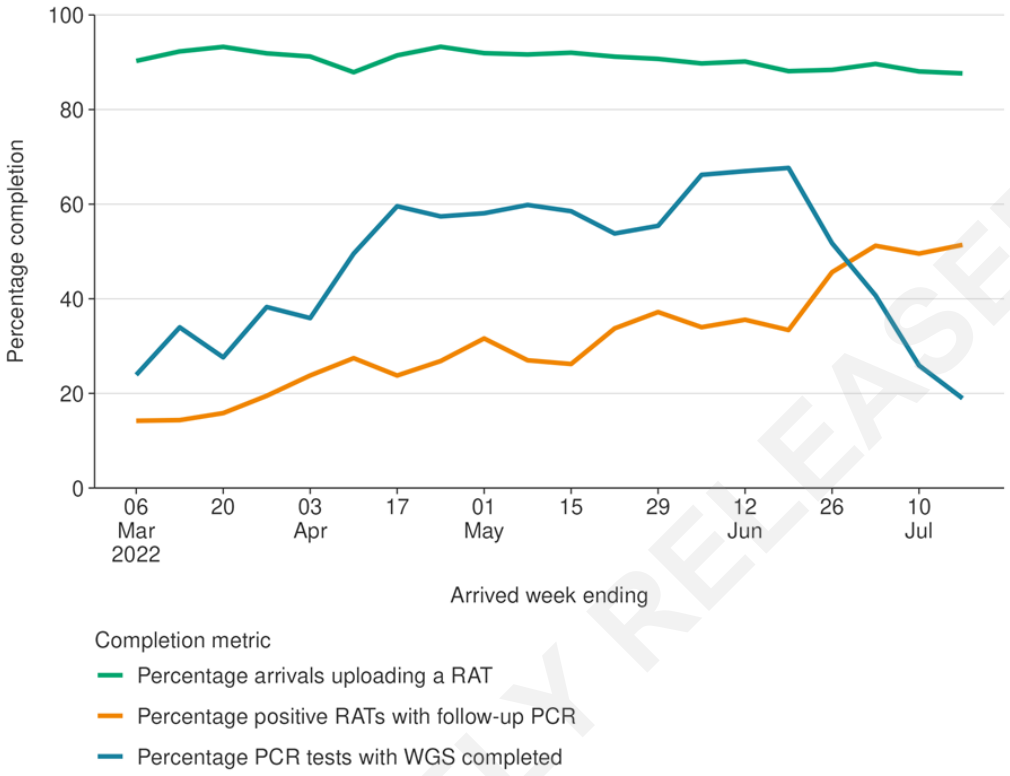
Sources: NCTS/EpiSurv/Éclair as at 2359hrs 17 July 2022

Whole Genomic Sequencing of Imported cases

Figure 18 shows the completion metrics for border returnee testing and WGS from 06 March to 17 July 2022. The percentage of arrivals uploading a RAT has been constant with an average of approximately 90%. In the week ending 17 July, there were 62,119 border arrivals, of whom 88% (54,443) uploaded a RAT result upon arrival. This is consistent to 88% in the week prior.

Genomic sequencing data is lagging by 1 or 2 weeks because of the time required for recent arrivals to report a positive RAT, seek a follow-up PCR and have processing completed by ESR.

Figure 18: Completion metrics for border returnee testing and WGS for arrivals, 06 March – 17 July 2022



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 03 July 2022, ESR WGS 17 July 2022[5]

Figure 19 shows the border returnee testing and WGS metrics for arrivals. In the week ending 17 July, 51.4% of border arrivals who returned a positive RAT had a follow-up PCR test. This is similar to 49.5% the week prior and is the highest we have seen in months.

In the week ending 17 July, the percentage of PCR positive border arrivals with WGS complete was 19%. This figure is quite low, however, it should rise as more of the recent cases are processed. From mid-April to mid-June, this figure was between 40%-70%. **Figure 19** shows that enough PCR swabs are being sent to ESR to meet the genomic surveillance target of 300 sequences a week.

Over half of the genomes sequenced at the border in the past fortnight are the watchlist variants; BA.4/5. These cases include reports of BA.2.75 in travellers to New Zealand. As at 9:00am 25 July, ESR had received samples from 380 of the 4,685 PCR-positive border cases with a report date in the two weeks to 22 July. Of the successfully sequenced samples, 67% were BA.5, 22% were BA.2, 10% were BA.4, <1% BA.2.75 and <1% BA.1.

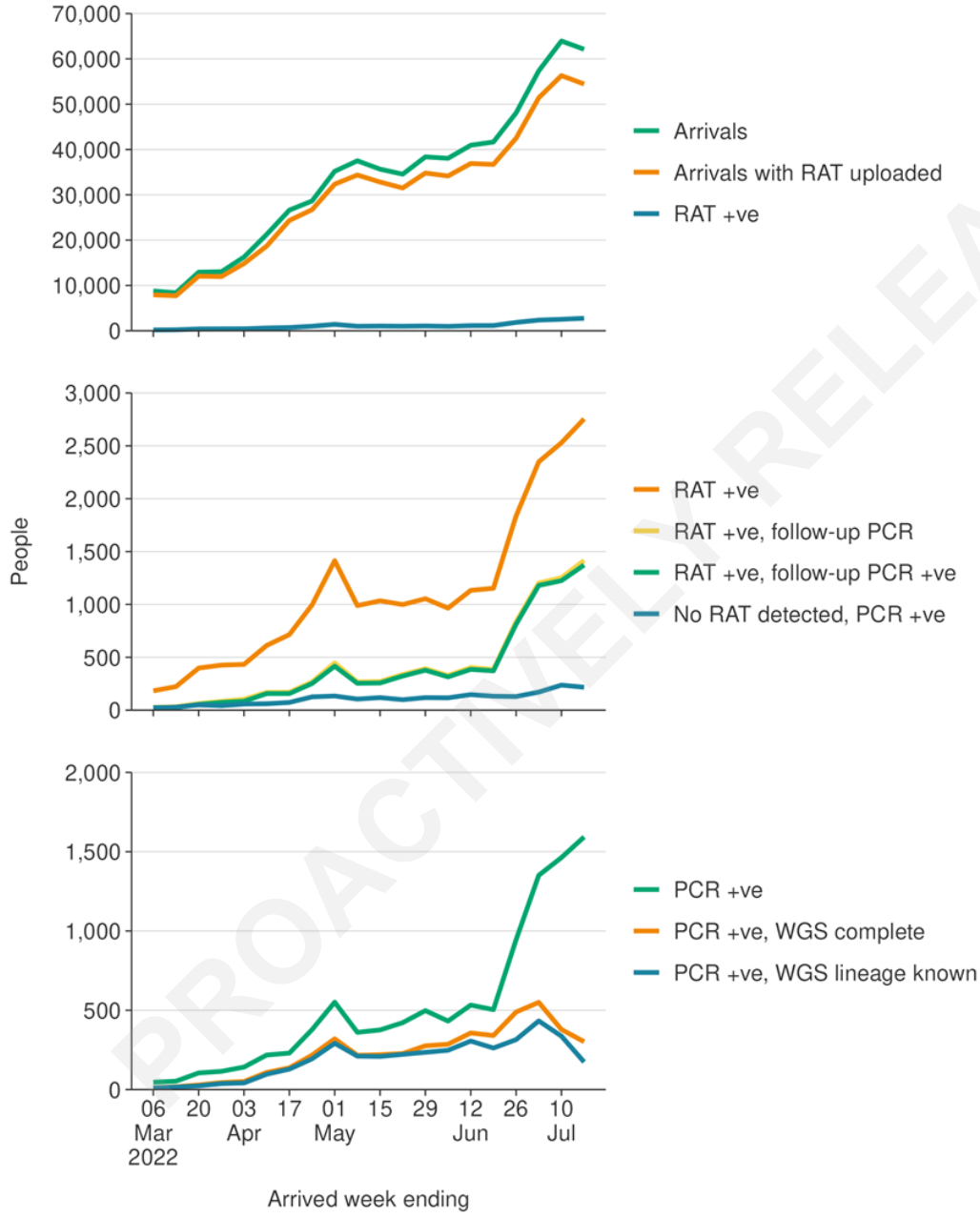
A case can only be referred to ESR for WGS if the traveller is referred for PCR testing and the lab sends the PCR sample for sequencing.

Testing and reporting at the border are a "high-trust" model, and it is not expected that there will be 100% compliance with testing amongst travellers.

[5] Please note that WGS may not be completed/uploaded yet for more recent cases

Labs are notified of all positive RAT results that are known to be from recent arrivals. However, up to 10% of arrivals have not completed a New Zealand Traveller Declaration that enables data linkage, and others may not be reporting RAT results.

Figure 19: Border returnee testing and WGS metrics for arrivals, 06 March – 17 July 2022



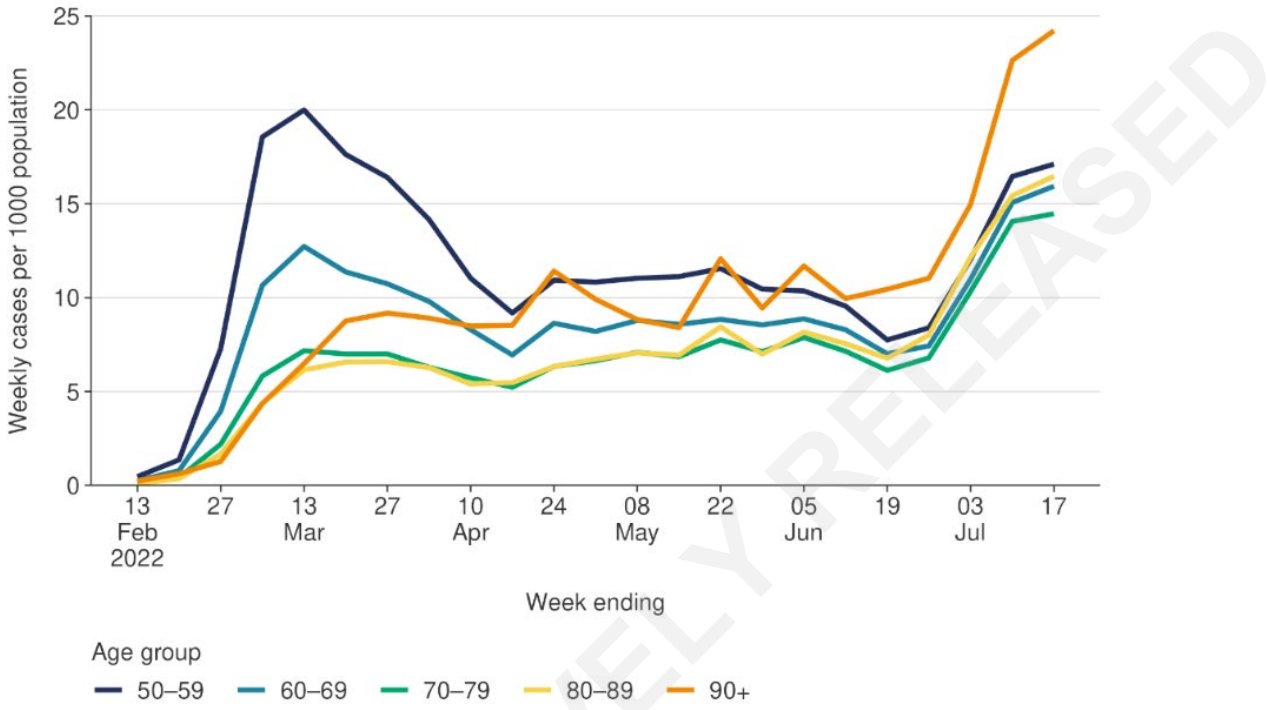
Sources: NCTS/EpiSurv/Éclair as at 2359hrs 19 June 2022, ESR WGS 17 July 2022[6]

[6] Please note that WGS may not be completed/uploaded yet for more recent cases.

Hospitalisation and Mortality

Hospitalisation and mortality risk is strongly linked with increasing age; there have been substantial increases in case rates in those aged over 60 years during the past month **(Figure 20**), and consequently a steady rise in the weekly numbers of deaths in the past month (see **Figure 27**).

Figure 20: Case rates (per 1000) in those aged over 50 years, 13 February to 17 July 2022



Source: NCTS/EpiSurv as at 2359hrs 17 July 2022

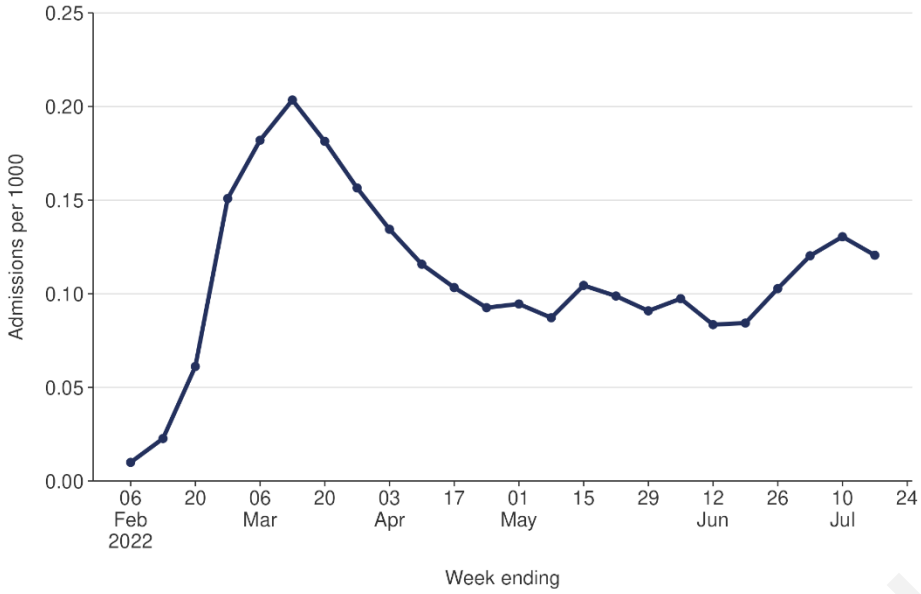
Hospital Admissions Rates

This is new hospital admission data that comes from a combination of two data sources - the inpatient admission (IP) dataset (which only includes data from hospitals in certain regions) and the National Minimum Dataset (NMDS). The IP records are included as a provisional tally of more recent COVID-19 hospitalisations for a collection of hospitals, and these records are overwritten by NMDS records as soon as the NMDS records are available. Please see Glossary for further details.

As seen in **Figure 21**, the COVID-19 hospital admissions rate increased for four weeks to 10 July but have tapered in the week ending 17 July.

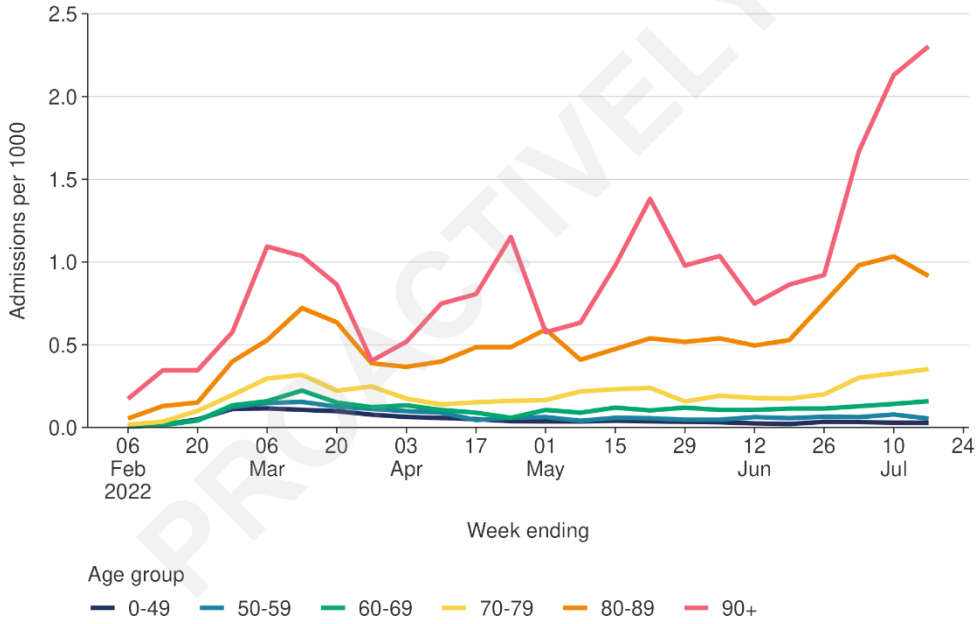
Hospital admission rates by age group (**Figure 22**) are highest for those who are 90 years and older, followed by those who are between 80-89 years old and those who are 70-79 years old. Admission rates among these age groups are the highest they have been this year.

Figure 21: COVID-19 hospital admissions rate per 1,000, 06 February to 24 July 2022



Source: NMDS/Inpatients admissions feed, 24 July 2022

Figure 22: Hospital admission rates by age group, 06 February to 24 July 2022

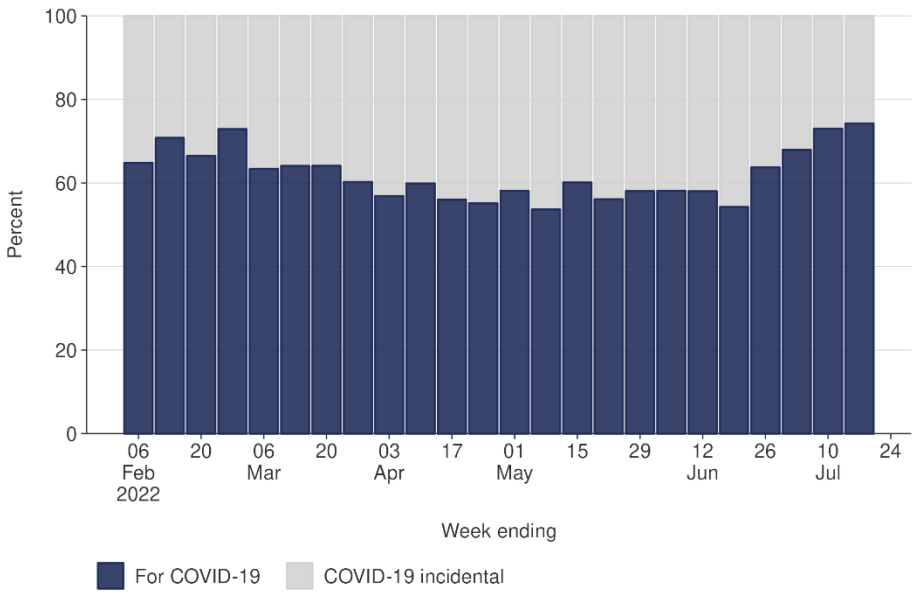


Source: NMDS/Inpatients admissions feed, 24 July 2022

Hospital admissions *For* vs *Incidental for COVID-19*

The new hospital admission data also allows us to estimate the number of hospitalisations where COVID-19 could be the reason for the hospital admission. Please see glossary for further caveats.

The following data shows hospital admissions *for* COVID-19 have been close to or above 60% for most of the year and is currently 74% for the week ending 17 July 2022.



Source: NMDS/Inpatients admissions feed, 24 July 2022

Hospitalisation Risk

Unadjusted and age-adjusted risk: Disparities in hospitalisation risk by ethnicity and deprivation are clearly observed after adjusting (age-standardising[7]) for differences in age demographics.

Priority populations (namely ethnic groups) that are at higher risk of experiencing severe outcomes also tend to be systematically younger in age on average. As older age is also a strong risk for severe outcomes, the risk by ethnicity and deprivation can be masked. Therefore, the hospitalisation risk for these communities must be adjusted for age in order to make an accurate comparison.

Figure 23**-21** show age-standardised rates of hospitalisation with COVID-19 broken down by ethnicity and deprivation, for the time period of March 2020 to 24 July 2022. Rates are standardised to the Māori HSU 2020 population age structure. **Non-overlapping confidence intervals between any two groups suggests the difference between those two groups is statistically significant.** Data comes from tertiary hospitals in the inpatient dataset. This data includes people admitted to hospital with COVID-19, but excludes those that were definitely admitted to hospital for a reason unrelated to COVID-19.

Pacific Peoples had the highest cumulative incidence rate of hospitalisation with COVID-19 which was 1.4 times higher than Maori ethnicity, 3.5 times higher than European or Other ethnicity and 3.7 times higher than Asian Peoples (**Figure 23**).

The most deprived areas had the highest rate of hospitalisation with COVID-19 (269.8 per 100,000) followed by areas of mid-range deprivation (146.1 per 100,000) and the least deprived areas (100.4 per 100,000) **(Figure 24**).

This analysis supports that, as well as being of an older age, being Māori or Pacific Peoples or in the most deprived areas increases risk for hospitalisation. This is especially true for risk of hospitalisation in those aged under 60 years.

[7] An age-standardised rate is a weighted average of the age-specific rates per 100,000 persons, where the weights are the proportions of persons in the corresponding age groups of the HSU 2020 Maori population.

Figure 23: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation with COVID-19 by ethnicity, March 2020 to 24 July 2022

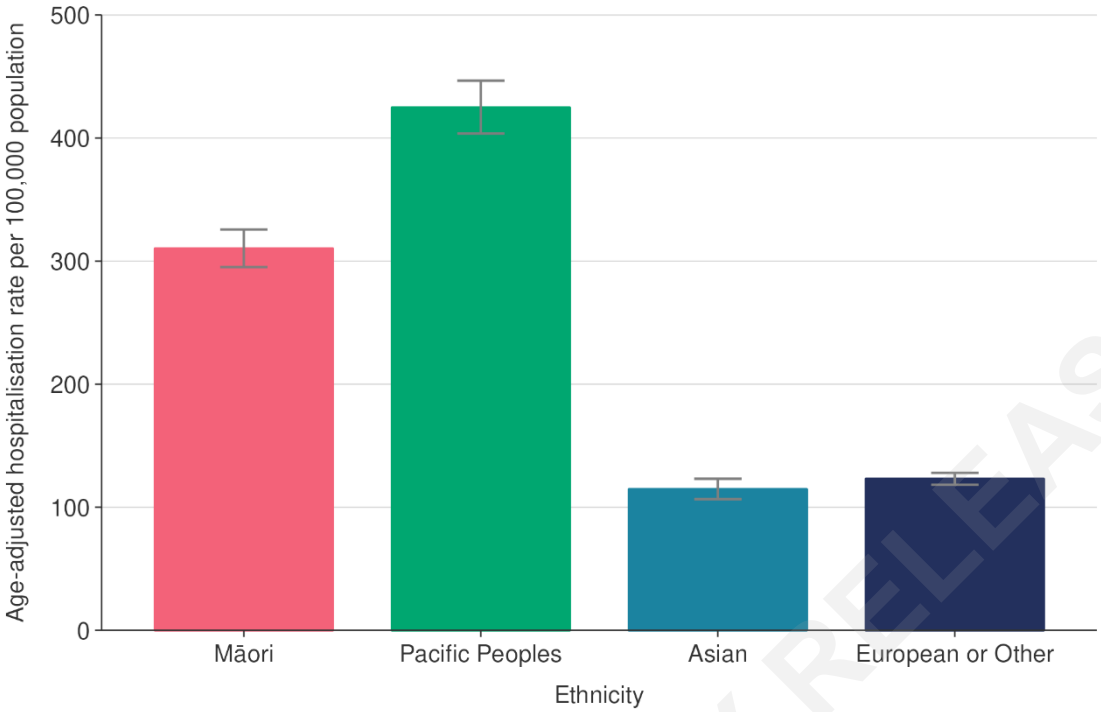
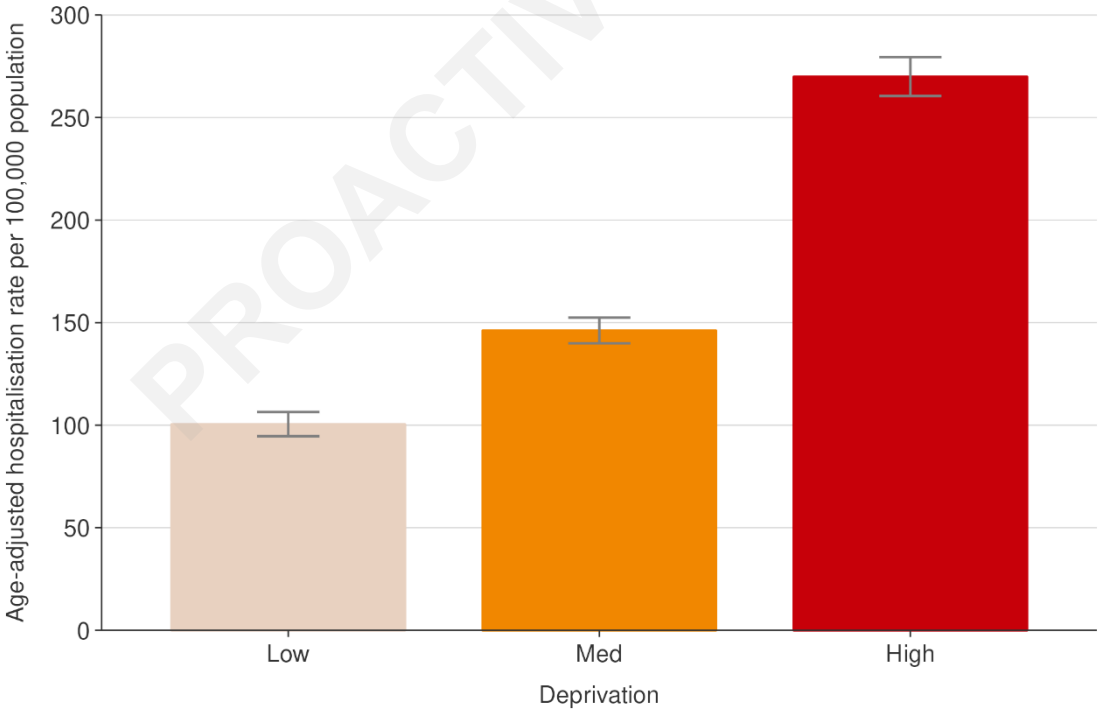


Figure 24: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation with COVID-19 by deprivation, March 2020 to 24 July 2022



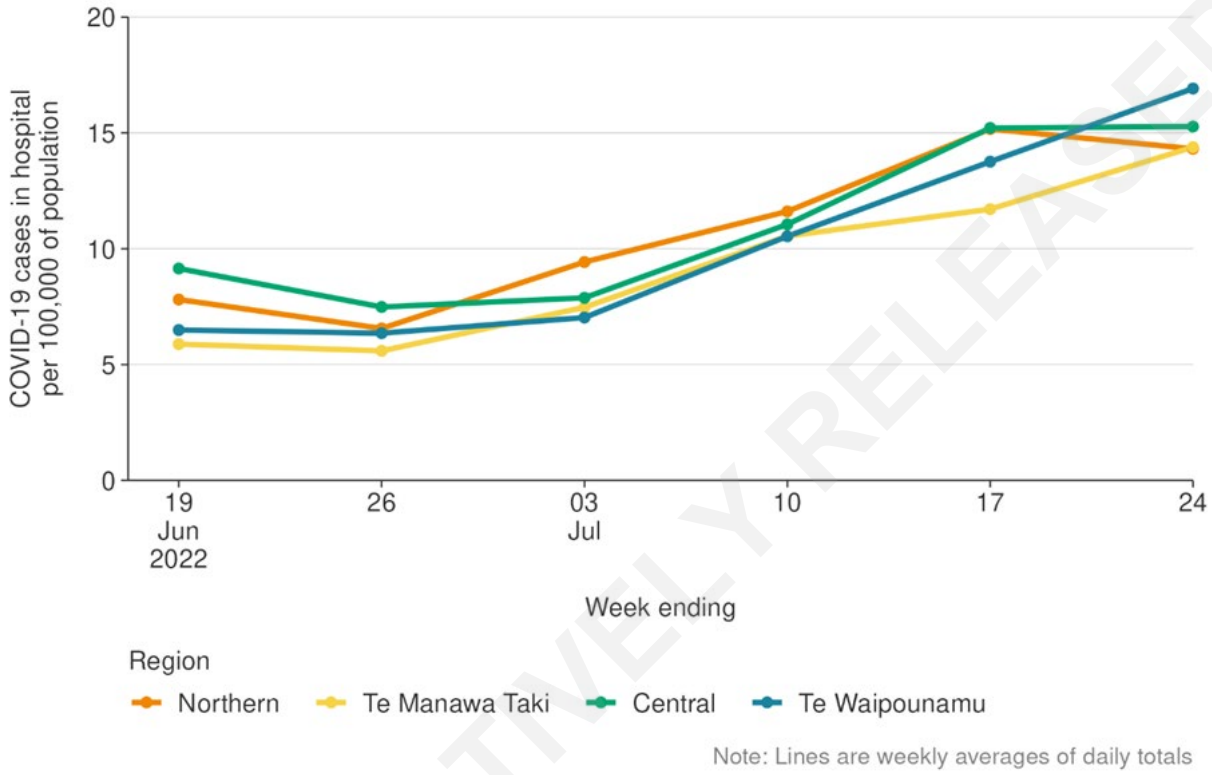
Hospital Occupancy

For the week ending 24 July, the national daily average hospital occupancy for inpatients with COVID-19 was 15.1 per 100,000 population, an increase of 6.1% from the week prior (**Figure 25**).

Daily hospital occupancy averaged per week increased across all regions, except for the Northern region in the past week. The Northern region (14.3 per 100,000) decreased by 5.7%, Te Manawa Taki (14.4 per 100,000) increased by 23%, Central region (15.3 per 100,000) stayed the same in the past week and Te Waipounamu (16.9 per 100,000) increased by 23%.

Due to varying definitions of an active case, there may be regional differences in the coding of COVID-19 infection status for hospitalisations.

Figure 25: Regional daily hospital occupancy averaged per week, 19 June – 24 July 2022



Source: Daily hospital questionnaire as of 24 July 2022

Whole Genomic Sequencing of hospitalised cases

As of 24 July, ESR received samples from and had processed 238 of the 738 PCR positive hospital cases with a report date in the two weeks to 22 July 2022. Of these, 19% had a BA.2 genome, 14% were BA.4, and 66% were BA.5.

ESR receives a daily list of active COVID-19 cases who tested positive in the past 14 days and were hospitalised in the past 7 days. ESR is working with the Ministry of Health to receive information indicating which cases have been admitted to ICU or HDU.

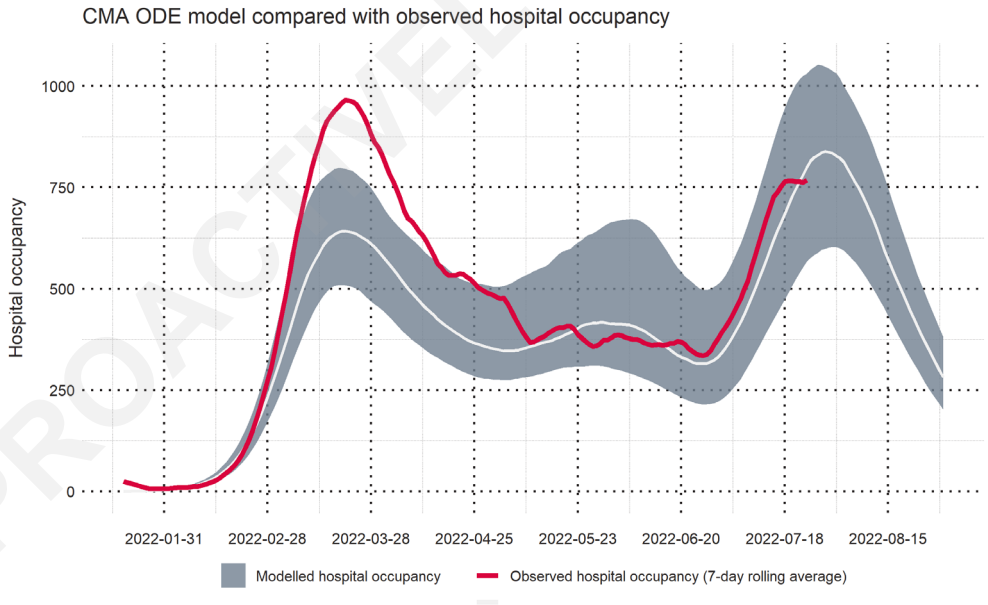
Modelled and actual hospital occupancy rate

The COVID-19 Modelling Aotearoa group's modelling scenarios track beds occupied by people with COVID-19 infections. **Figure 26** compares hospital occupancy with the latest modelling scenario. The white line is the median prediction and grey areas indicate the upper and lower ranges of the prediction.

This is a new scenario that assumes that previous infection provides greater protection against reinfection and severe disease, consistent with emerging international evidence. It also, incorporates updated data and future projections of uptake of second boosters, and an earlier transition to BA.5, consistent with the timing of cases and hospitalisations in New Zealand.

The peak is projected to occur between late July and early August with daily hospitalisations rising to approximately 800 a day. Currently hospitalisations are tracking just under the median predicition.

Figure 26: COVID-19 Modelling Aotearoa hospital occupancy scenarios compared to actual hospital occupancy

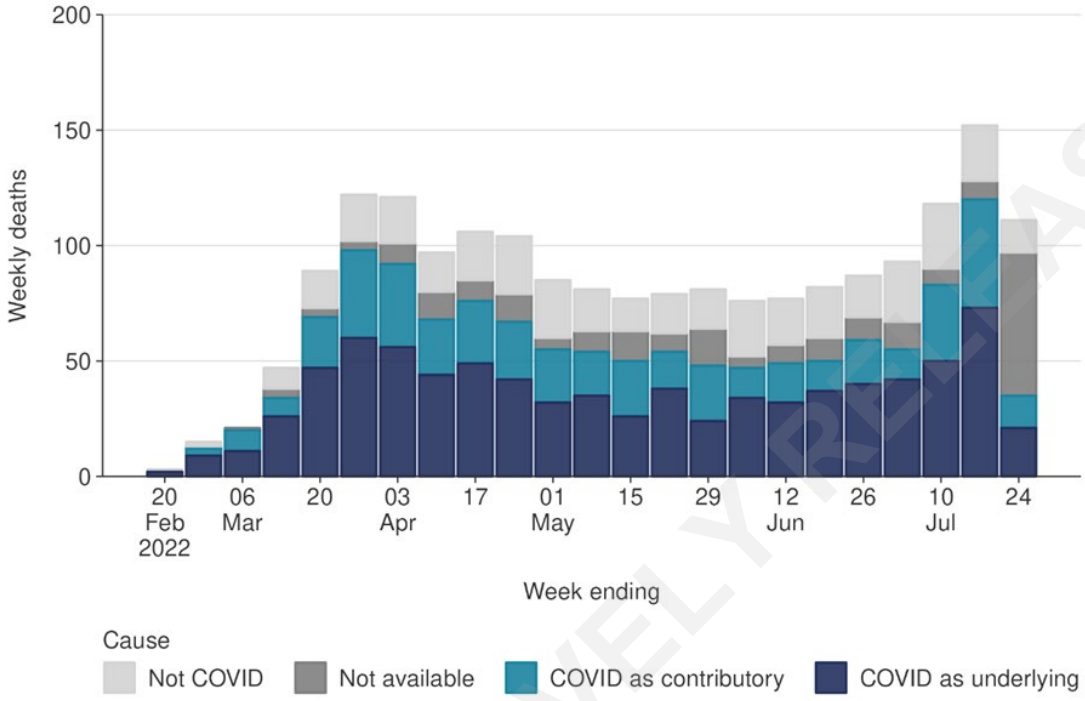


Sources: COVID-19 Modelling Aotearoa (CMA) Branching Process Model July 2022, hospital occupancy (all COVID-19 positive people admitted as inpatients) as of 24 July 2022.

Mortality

From March 2020 to 28 July 2022, there were 2,056 deaths with COVID-19 infection who died within 28 days of being reported as a case and/or with the cause being attributable to COVID-19 (that is an underlying or contributory cause). Of these deaths that have been formally coded by cause of death, 940 (48%) were determined to have COVID-19 as the main underlying cause. COVID-19 contributed to a further 515 deaths (26%). Another 437 people died of a separate, unrelated cause (26%).

Figure 27: Weekly death counts by cause of death, 20 February to 24 July 2022



Source: Ministry of Health. All deaths where someone has died within 28 days of being reported as having a positive test result for COVID-19 are reported. This approach aligns with countries such as the United Kingdom; it ensures that all cases of COVID-19 who die are formally recorded to help provide an accurate assessment of the impact of COVID-19.

All of the deaths within 28 days of a positive test report are fast-tracked for clinical/mortality coding to determine whether the infection was the underlying cause of the death, contributed to the death, or was unrelated to the death. An example of an unrelated death is a car accident; an example of a COVID-19 contributing is a person who dies who also has a pre-existing health condition.

Comparisons in COVID-19 Mortality

Unadjusted and age-adjusted risk: Disparities in mortality risk by ethnicity and deprivation are clearly observed after adjusting for differences in age demographics.

The ethnic and deprivation groups that tend to be associated with higher mortality risk also tend to be systematically younger in age on average. Therefore, the mortality risk for these communities must be adjusted for age in order to make an accurate mortality comparison. **Non-overlapping confidence intervals between any two groups suggest the difference between those two groups is statistically significant.**

Figure 28 shows that for total COVID-19 attributed mortality rates by ethnicity, Pacific Peoples had the highest rate which was 1.4 times higher than Maori ethnicity, 3.4 times higher than European or Other ethnicity and 4.7 times higher than Asian Peoples.

Figure 29 shows that for total COVID-19 attributed mortality rates by deprivation, the most deprived areas had the highest rate (13.7 per 100,000), followed by mid-range deprivation areas (8.7 per 100,000) and the lowest rate was in the least deprived areas (5.2 per 100,000).

Figure 28: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by ethnicity, March 2020 to 24 July 2022

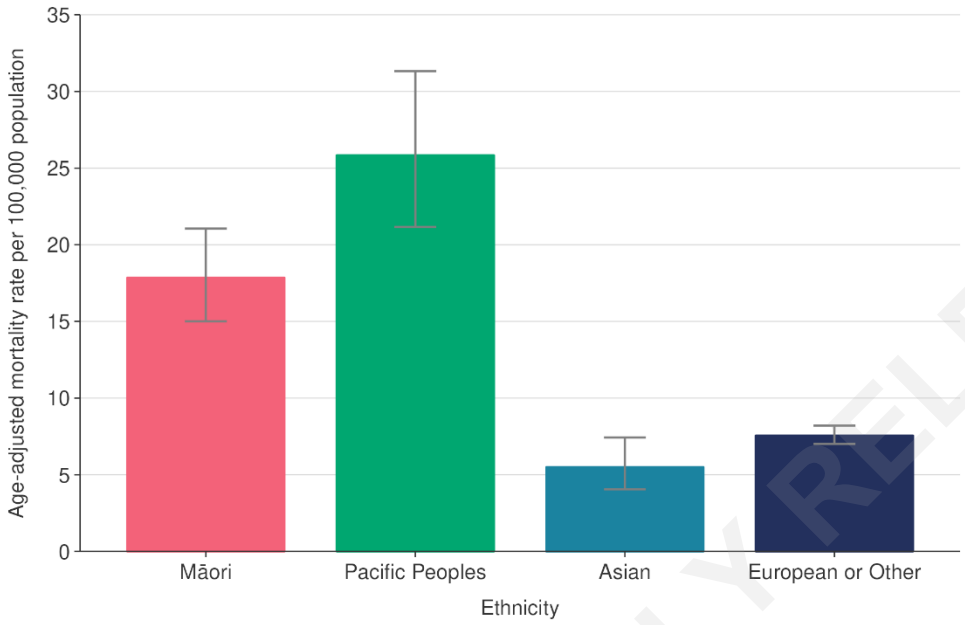
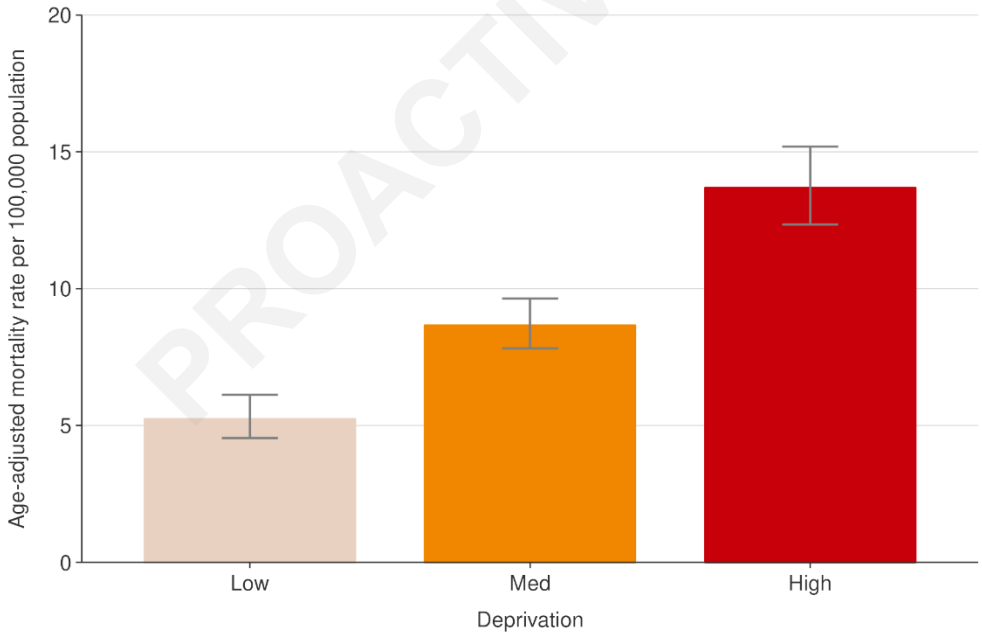


Figure 29: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by deprivation, March 2020 to 24 July 2022



This analysis supports that, as well as age being a strong risk for death, there is excess risk for Māori and Pacific Peoples, and for those in high deprivation.

All cause death rates

Details and methods are published by Statistics NZ at https://www.stats.govt.nz/experimental/covid-19-data-portal under "Total death rates" in the "Health" section of its COVID-19 data portal.

International and Scientific Insights

Please note, global trends in cases and deaths should be interpreted with caution as several countries have been progressively changing COVID-19 testing strategies, resulting in lower overall numbers of tests performed and consequently lower numbers of cases detected.

Overseas waves and the likely impacts of new variants, policy changes, notifiable disease and waning immunity

Globally

- Globally, in the week ending 24 July 2022, the number of weekly cases was similar to the previous week, with 6.6 million new cases reported.
- The number of new weekly deaths is also similar to the week prior with 12,600 deaths reported.
- At the regional level, the number of new weekly cases increased in the Western Pacific Region (+52%), the Eastern Mediterranean Region (+45%) and the South-East Asia Region (+13%), while it decreased in the African Region (-44%), the European Region (-24%), and the Region of the Americas (-12%).
- The number of new weekly deaths increased in the Eastern Mediterranean Region (+88%), the Western Pacific Region (+19%) and the South East Asia Region (+8%), while it decreased in the African Region (-47%) and the European Region (-6%). The number of new weekly deaths in the Region of the Americas was similar to the figure reported during the previous week
- Globally, from 21 June to 21 July 2022, 193,561 SARS-CoV-2 sequences were collected and submitted to GISAID. The Omicron VOC remains the dominant variant circulating accounting for 90.1% (175,679) of sequences.
- A comparison of sequences submitted to GISAID in the week ending 16 July and the week ending 9 July shows a decline in BA.2 sequences from 3.6% to 2.2% and a decline in BA.2.12.1 sequences from 6.4% to 2.7%. Within the same period, the proportion of reported sequences of BA.4 increased from 11.1% and 11.2% and BA.5 decreased from 52.4% to 52%.
- BA.2.75 is an Omicron subvariant under monitoring by the WHO, with earliest sequences reported from May 2022. As of 18 July, 250 sequences of BA.2.75 from 15 countries have been reported to GISAID.

Australia

- As at 26 July, there are 5,571 COVID-19 cases admitted to hospital in Australia with the majority of hospitalisations seen in New South Wales (2,344), Queensland (1,123) and Victoria (869).
- Hospitalisations in Australia are at their highest recorded levels since the start of the pandemic as the country experiences a winter wave of COVID-19 infections. The Australian Medical Association (AMA) is urging the government to introduce measures, including mask mandates, to ease the pressure on the healthcare system as this surge peaks in the coming weeks.

United Kingdom

- The Office for National Statistics (ONS) reports that infections are increasing in England (5.77%) while infection trends in Wales (6.03%), Northern Ireland (4.82%) and Scotland (6.48%) are uncertain based on data for the week ending 13 July (for England and Wales) and 14 July 2022 for Northern Ireland and Scotland.

- An estimated 2 million people in private households (3.0% of the population) were experiencing self-reported long COVID as of 4 June 2022.
- The overall hospital admission rate of COVID-19-confirmed patients in England continued to increase to 18.34 per 100,000 people, while the intensive care unit (ICU) and high dependency unit (HDU) admission rate continued to increase to 0.71 per 100,000 people in the week ending 17 July 2022.
- Deaths involving COVID are increasing in the UK with 694 deaths registered for the week ending 15 July, an increase from 529 deaths the week prior.

Japan

- Japan is currently reporting more new COVID-19 cases than any other country with over 200,000 new per day. The country has faced a sharp rise in infections during its current 7th wave of the pandemic with Omicron subvariant BA.5 as the dominant circulating variant now.
- After experiencing a large surge in cases in early February, infections had significantly decreased until early July when cases have quickly risen to their highest recorded levels for the country since the beginning of the pandemic.
- Cases are primarily in Tokyo and Osaka, two of the three largest areas.
- Osaka has raised its alert level to the highest setting after reaching record daily cases.
- From 20 July to 26 July, cases requiring hospitalisation have steadily risen from 797,212 to 1,290,690.
- In this same period, cumulative deaths have risen from 54 to 108.

France

- French parliament has moved to end the state of health emergency and COVID-19 related measures on 1 August. France has now adopted a bill that allows the government to require a negative COVID-19 test from abroad or overseas territories and requires the government to negotiate any exceptional powers with parliament one-by-one in the case of future health crises.
- Controversially, the new bill allows reinstatement of unvaccinated healthcare workers – a decision that has been opposed by France's public health authority and medical unions.

Primary evidence on effectiveness of public health and outbreak control measures.

This section outlines some of the available literature about the effectiveness of public health and outbreak control measures. It is not intended to be a systematic review of all available evidence, but to provide an overview of available evidence.

- A review of Taiwan's mitigation and containment strategy found that non-pharmaceutical interventions, including public masking and social distancing, coupled with early and aggressive identification, isolation, and contact tracing to inhibit local transmission were optimal policies for public health management of COVID-19 and future emerging infectious diseases.
- A research article on COVID-19 testing and mortality outcomes between countries found that countries that developed stronger COVID-19 testing capacity at early timepoints, as measured by tests administered per case identified, experienced a slower increase of deaths per capita.
- A study on behavioural decisions and risk perception through monitoring the flows of information from both physical contact and social communication found that maintaining focus on awareness of risk among each individual's physical contacts promotes the greatest reduction in disease spread, but only when an individual is aware of the symptoms of a non-trivial proportion of their physical contacts.

- A commentary in the Lancet on face masks suggests that mass masking would be of particular importance for the protection of essential workers who cannot stay at home. As people return to work, mass masking might help to reduce a likely increase in transmission.
- A research article on the efficacy of non-pharmaceutical interventions for COVID-19 in Europe found that the population prevention and control measures implemented by the government had an impact on the change in the reproduction rate. Furthermore, that most effective factors in individual level prevention was a reduction of mobility/mixing.
- A modelling study looking at the impact of non-pharmaceutical interventions on controlling COVID-19 outbreak without lockdowns in Hong Kong found that delays in implementing control measures had significant impact on disease transmission.
- A survey of COVID-19 in public transportation looking at the risk of transmission and the impact of mitigation measures found that social distancing, density limits, masking and improving ventilation were effective at reducing the risk of transmission. Reff decreased by 20.3% after the introduction of targeted testing and by 17.5% after extension of face-mask rules, reducing Reff to 0.9 and suppressing the outbreak.
- A evidence brief on the properties of the Omicron variants and how it affects public health measures effectiveness found that the effects of early isolation, adult-focused reduction of interpersonal contact, and vaccination have different sites of action in infection spread dynamics and their combination can work synergistically. Implementing all the interventions has a synergistic effect on controlling the COVID-19 epidemic, even if the impact of each intervention is moderate. Additional public health measures for children could further help the mitigation
- A preprint study has noted that reinfections of COVID-19 are associated with an increase of risk of all-cause mortality, hospitalisation, and adverse health outcomes. A study of 39,000 people with reinfections were compared against 257,000 people who had one infection and 5,396,855 of those who had no infection. Those who experienced a reinfection had increased post-viral sequelae of pulmonary and extrapulmonary organ systems including cardiovascular disorders, coagulation and hematologic disorders, fatigue, gastrointestinal disorders, kidney disorders, diabetes, musculoskeletal disorders, and neurological disorders. This suggests that for people who already had a first infection, prevention of a second infection may protect from additional health risks, and therefore prevention of infection and reinfection with SARS-CoV-2 should continue to be the goal of public health policy.
- A Canadian wastewater research paper has noted that the lack of a quantitative framework to assess and interpret the wastewater data generated has been a major hurdle in translating wastewater data into public health action.
- A population study using a surveillance dataset that records all results of SARS-CoV-2 tests in France found a positive social gradient between deprivation and the risk of testing positive for SARS-CoV-2.
- A mathematical modelling study assessing the impact of public compliance on non-pharmaceutical interventions with a cost-effectiveness analysis.
- An evaluation of COVID-19 policies in 50 different countries and territories considers both pharmaceutical and non-pharmaceutical interventions and assesses a jurisdiction's success at containing COVID-19 both prior to and after vaccination.
- An observational study on the impact of contact tracing and testing on controlling COVID-19 without lockdown in Hong Kong.
- A cross-sectional study comparing OECD countries in evaluating economic outcomes found that non-pharmaceutical interventions effectively contained the outbreaks and had positive impacts in lowering unemployment rates.

- A modelling study points to the role of super-spreader events in the contribution of novel variant predominance from a public health perspective, the results give weight to the need to focus NPIs on preventing large super-spreader events (10 or 20 secondary infections from single infected individual).
- A preprint study on social gatherings and transmission found that small gatherings, due to their frequency, can be important contributors to transmission dynamics.
- Systematic review of economic evaluations of COVID-19 interventions

Isolation modelling

CMA have performed a number of simulations with different combinations of case isolation and contact quarantine requirements. This was for a period (May 2022) with decreasing case numbers, and a different sub-variant (BA.2), so the absolute numbers are not reliable, but the relative magnitude of impact especially between case and contact rules is informative.

The network contagion model (NCM) is used to estimate the short-term (around one month) impact. The requested scenario results are summarised in Table 1. The following modelling assumes there are no additional public health precautions after release from isolation/quarantine, or instead of quarantine, that further mitigate transmission.

Based on evidence from studies looking at viral load (CT value) through time, and studies looking at live viral culture, CMA have produced an updated estimate of the duration of the infectious period for the Omicron variant (referred to in Table 1 as default).

Based on the recent paper published by Boucau et al (2022), a 'longer' infectious period distribution has also been produced, which can be thought of as an upper bound which would apply for symptomatic cases (referred to in Table 1 as (NEJM)).

Table 1 – Short term results for cases (impact approx. one month following any change):

	Isolation requirements	**% of cases infectious at release default vs. (NEJM)**
Scenario 0	**Cases:** Baseline (7-day isolation)	15% (41%)
Scenario 1	**Cases:** Maintain 7-day isolation plus one negative RAT to release (**maximum 10-day isolation**)	9% (30%)
Scenario 2	**Cases:** Reduce isolation to 5-day minimum plus one negative RAT to release (**maximum 7-day isolation**)	21% (50%)
Scenario 3	**Cases:** Reduce isolation to 5-day minimum plus one negative RAT to release (**maximum 10-day isolation**)	18% (43%)
Scenario 4	**Cases:** Increase isolation to 10-days	5% (20%)

Health System Capacity

Omicron Dashboard

Pharmacy: There continues to be reports of staff working long hours, for extended periods. Some pharmacies continue to operate for reduced hours.

Aged Residential Care: As at 19 th July, 4% of ARC facilities had at least one COVID 19 case. 755 cases were reported in ARC facilities on July 12 th the highest ever. This has reduced to 649 as at 25 th July.

Pacific Health providers: report hight demand for food parcels and many are experiencing workforce shortages due to winter illnesses.

Home & Community Care: We continue to see a reduction in total numbers of employees compared with October to December last year (9% decline) and a decline in total services delivered compared with October to December last year (5% decline).

Emergency Departments: Increase in number of patients staying 7 days or above, combined with high numbers of COVID 19 cases in hospital is impacting on flow through ED and hospital's nationally. Five day rolling average of ED presentations was elevated in late June however has dropped off slightly in July. The number of patients who are seen and treated within 6 hours in ED continues to decline.

Workforce: We continue to see clinical staffing constraints across the motu. Clinical absenteeism is consistently between 10 - 15% in all regions. There are considerable capacity constraints staff sickness absence (COVID 19 and non COVID) further limits the provider delivery system's ability to respond to all demands. This is not unique to NZ other countries experiencing similar challenges at this point in the pandemic and there is intense global competition for healthcare workforce. Te Whatu Ora have recently introduced a National Seasonal Pressures Operating Model to support the delivery system in mitigating these pressures.

Care in the Community

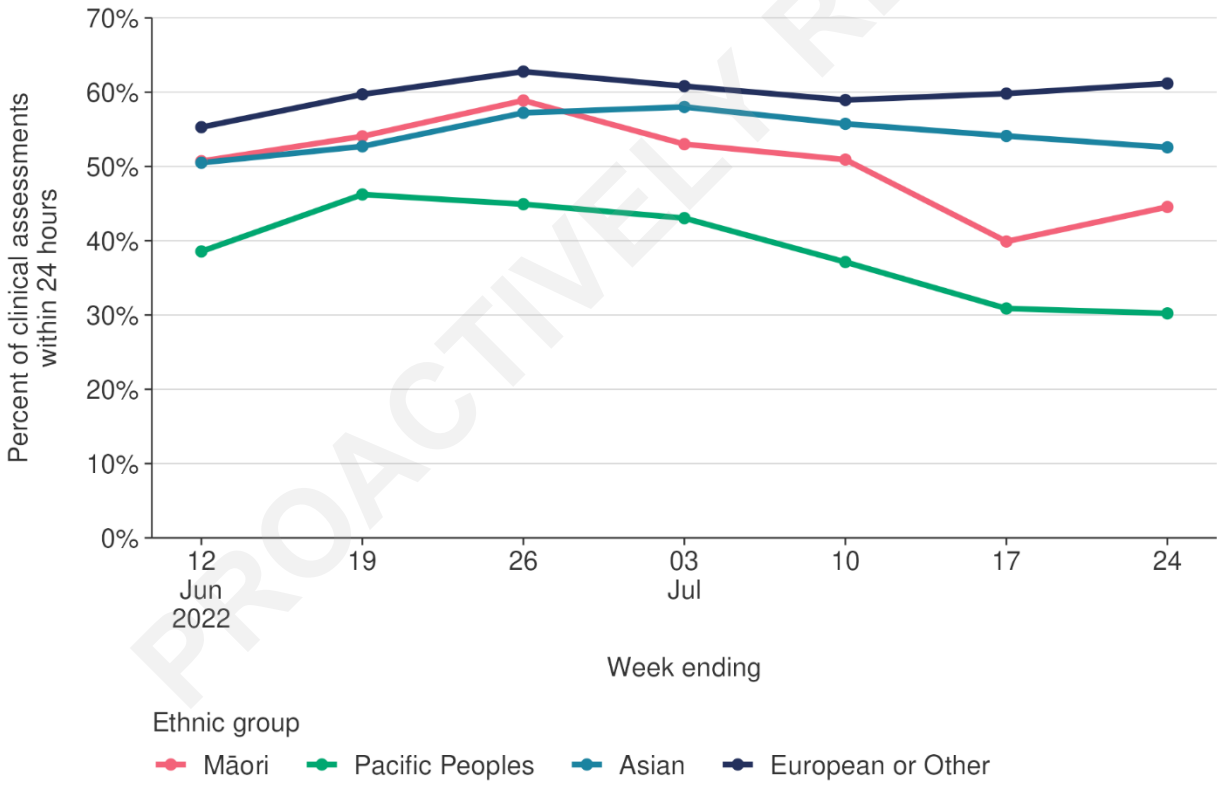
Health System Indicators

The Ministry of Health and the Ministry of Social Development collaborated to develop COVID-19 Care the Community (CitC). This program is to provide support for people in self-isolation and is regionally coordinated through Care Coordination Hubs. Each hub brings together local providers of public health and welfare support, including district health boards, public health teams, general practice teams, Ministry of Social Development, welfare providers, iwi, Māori and Pacific providers.

Figure 30 shows the percentage of clinical assessment completed within 24 hours by ethnicity. In the week ending 24 July 45% of Māori, 30% of Pacific Peoples, 53% of Asians and 61% of European or Other had clinical assessment completed within 24-hours. This trend has been similar for all ethnic groups for the past month.

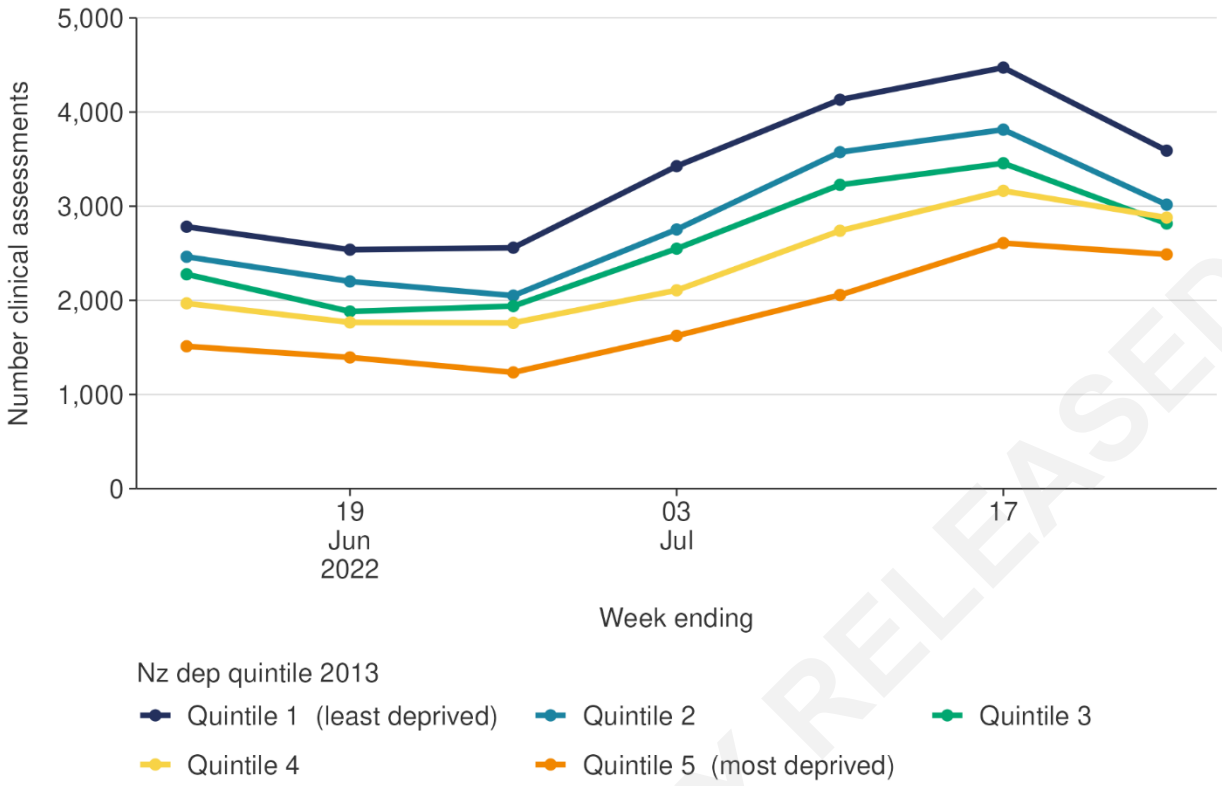
Figure 31 shows the number of clinical assessments by deprivation. Last week, people residing in the least deprived areas have a higher number of completed clinical assessments compared to those living in the most deprived areas, a difference of 1,102.

Figure 30: Percent of initial clinical assessment completed within 24 hours of positive case by ethnicity, 12 June – 24 July 2022



Sources: CCCM/QLIK, Socrates 24 July 2022

Figure 31: Number of clinical assessments by deprivation 05 June – 17 July 2022



Glossary

Data Sources

Community Cases

Data on community cases is sourced from a combination of the National Contact Tracing Service (NCTS) and EpiSurv (New Zealand's public health surveillance platform).

Whole genome sequencing (WGS)

All information on WGS is sourced from the ESR COVID-19 Genomics Insights (CGI) Report, a weekly overview of SARS-CoV-2 genomic surveillance across the country.

Prevalence Estimates

National estimates of underlying infection incidence are based on the weekly test positivity in routinely asymptomatically tested populations, assuming therefore that their positivity rates are indicative of their underlying infection rates. The populations identified for these estimates using surveillance codes provided for testing data are border, emergency and healthcare work forces, as well as hospital inpatients. Inpatient estimates are also produced based on a direct data feed from Tertiary hospitals rather than identifying inpatients in the national testing database; they are therefore more accurate than the national figures.

Wastewater quantification

Wastewater quantitation is a measure of the levels of virus circulating in the community. Because infectious individuals tend to shed vastly more viral particles than non-infectious individuals (particularly later on in the infection), the wastewater quantitation results are driven largely by infectious individuals, in the first 5-6 days of their infection. Although people can shed detectable virus for some weeks that can be detected by PCR testing, these individuals are unlikely to have a large impact on the quantitation curves.

Wastewater is analysed by ESR's Kenepuru and Christchurch Laboratories.

Data limitations

Prevalence estimates based on routinely tested populations

- The groups of routine testers that have been identified (healthcare, border and emergency workers, and hospital inpatients) are not a representative sample of New Zealanders, overall, they are higher risk of COVID-19 infection than the general population.
- The identification of these groups at a national level is based on surveillance codes, which may not be completed accurately, particularly since the introduction of RAT testing.
- The national estimate is for people who have uploaded at least one test result in the week, so will be an over-estimate if negative test results are not being recorded for these groups.
- National level estimates will be masking differing trends by region.
- Tertiary hospital inpatient data, while likely to be more accurate than the national level data, still reflects a higher-risk group, and neither the estimates nor the trends are generalisable to the rest of the population.
- The identification of these groups is based on surveillance codes, which may not be completed accurately, particularly since the introduction of RAT testing.
- The population has been identified based on ever having a surveillance code related to the respective workforce and having at least 2 tests (at least one of which was negative) in 2022. A sensitivity check was run using at least 3 tests and while these numbers reduced, the incidence estimates remained very similar.

Wastewater quantification

- Approximately 1 million people in New Zealand are not connected to reticulated wastewater systems.
- Samples may be either grab or 24-hour composite samples. Greater variability is expected with grab samples.
- While a standard method is being used, virus recovery can vary from sample to sample.
- SARS-CoV-2 RNA concentrations should not be compared between wastewater catchments.
- Day-to-day variability in SARS-CoV-2 RNA concentrations especially in smaller catchment is to be expected.

Hospital admissions data

- The Ministry will begin reporting COVID-19 hospitalisations using two datasets: the inpatient admission (IP) dataset -- that only includes data from hospitals in certain regions -- and the National Minimum Dataset (NMDS). Both of these datasets are patient-level, so they allow demographic and vaccination breakdowns to be calculated.
- Of the two databases, the IP is the more up-to-date data source for admissions. The data provided includes a preliminary assessment of hospitalisations where COVID-19 may potentially play a role in the hospitalisation, based on the health specialty associated with the hospitalisation. The IP data does not have national coverage; it only covers hospitals in Auckland, Canterbury, Southern, Counties Manukau, Waikato, Capital & Coast, Waitemata and Northland. The IP data can be incomplete and provisional; it is subject to revision as the more comprehensive and more accurate NMDS data becomes available. One caveat is that the IP dataset does not have a reliable discharge date field. As such, it should only be used to report on admissions, not occupancy.
- The NMDS has several advantages: it provides national coverage and is a rich source of data, including data on demographics and an evaluation of the disease conditions associated with the hospital stay (including whether the admission was incidental, i.e., not related to COVID-19). However, the NMDS is only available after a significant data lag. The time lag for hospitalisation data can vary, but can be approximately 60 days or more.
- Therefore, we are using a combination of these two databases for hospitalisation: the IP records are included as a provisional tally of more recent COVID-19 hospitalisations for a collection of hospitals, and then these records are overwritten by NMDS records, as soon as the NMDS records are available
- Note that the definition used for ‘hospitalisation for COVID-19' in both the IP and NMDS tends to be inclusive. For the IP provisional data, the health specialty associated with the hospitalisation is used to estimate whether the hospital stay might be related COVID-19; hospitalisations that are highly unlikely to be related to COVID-19 are ruled out, as opposed to identifying hospitalisations that are likely to be COVID-related. As NMDS data becomes available, the clinical codes that retrospectively evaluate the reasons for the hospital stay are used to estimate if the stay was potentially related to COVID-19. The NMDS data is a more robust estimate of hospitalisations ‘for’ COVID-19.

- This new method of data collection for COVID-19 has several advantages over the previous method, as it provides more robust data in a timely manner, using an automated method that is less burdensome and more reliable, and provides access to more detailed data. Most importantly, the new data method provides a timely and reliable way to estimate the number of hospitalisations where COVID-19 could be the reason for the hospital stay (admissions 'for' COVID-19, with some caveats). Moving forward, the majority of the reporting on hospitalisation will use the 'for COVID' definition as described above from the new databases.
- Nonetheless, we are also still able to estimate the number of hospitalisations 'with' COVID-19, i.e., an estimate of the number of hospitalisations that are associated with a positive test within 28 days of admission. Hence, in conjunction with the new hospitalisation data, we can also estimate the proportion of the total COVID-19 hospitalisations that are 'for' versus 'with'. Previous analysis has shown that the proportion of the total COVID-19 hospitalisations that are 'for' COVID-19 is about 68%.
- In addition, the new system also allows us to estimate the rate of COVID-19 hospital admissions per case or per capita.
- However, the new data feed cannot be used to estimate the proportion of all hospitalisations nationally that are associated with COVID-19. This is because we do not know the total number of patients that currently are in hospital in New Zealand for any reason at any given time (this information exists in NMDS, but only with a lag of a couple of months). Without this denominator data, we cannot calculate the proportion of all hospitalisations are associated with COVID-19.