# Trends and Insights Report

Updated 05 August 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 outbreak, 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 9.8 per 1,000 population for the week ending 31 July. This is a 17.8% decrease from the previous week, which was 12.0 per 1,000.
- For the week ending 31 July, estimates suggest that 2.0% (676/33,932) 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 (19.9 per 1000 vs 9.8 per 1000).
- Levels of viral RNA in wastewater have overall plateaued but have increased in Auckland Metro and Te Manawa Taki and decreased in Central and Te Waipounamu.
- Contradictory to other trends, wastewater levels indicate that there has been no substantial decrease in the level of new infections.
- In the past week, all 18 Districts experienced a decrease in case rates.

*Demographic Trends in Case Rates*

- The lowest case rate continues to be in Pacific Peoples (6.1 per 1,000); case rates in this group have decreased by 10.7% in the past week. Māori case rates have also decreased and are now at 7.1 per 1,000.
- For the 65+ age group, case rates in the Northern region decreased by 22.6%, Te Manawa Taki decreased by 10.2%, Central decreased by 22.5% and Te Waipounamu decreased by 25.5% 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 12.4 per 1,000 and 65+ age group at 11.3 per 1,000.

*Hospitalisation and Mortality*

- Pacific Peoples had the highest cumulative incidence rate of hospitalisation with COVID-19 which was 1.4 times higher than Māori ethnicity, 3.4 times higher than European or Other ethnicity and 3.6 times higher than Asian Peoples
- The most deprived areas had the highest rate of hospitalisation with COVID-19 (269.6 per 100,000) followed by areas of mid-range deprivation (145.5 per 100,000) and the least deprived areas (101.6 per 100,000)

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- For the week ending 31 July, the national daily average hospital occupancy for inpatients with COVID-19 was 16.0 per 100,000 population, an increase of 5.7% from the week prior. Hospital occupancy average rates increased across all regions, except for the Northern region in the past week. The Northern region (14.3 per 100,000) remained the same, Te Manawa Taki (16.8 per 100,000) increased by 16.5%, Central region (16.4 per 100,000) increased by 7.1% in the past week and Te Waipounamu (17.8 per 100,000) increased by 5.2%.
- As of 31 July 2022, there were 2,321 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 the deaths that have been reviewed, 49% had COVID-19 as the main underlying cause, and COVID-19 contributed to 27% of deaths. The remaining 23% were found to be due to unrelated causes, such as accidents.

*Whole Genomic Sequencing*

- Omicron BA.5 was the dominant subvariant accounting for about 76% 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 almost all sites. The rise of the BA.5 variant of Omicron is a key observation.
- It is likely that BA.5 is largely responsible for the current national increase in case rates. As of 01 August, ESR received samples from and had processed 245 of the 790 PCR positive hospital cases with a report date in the two weeks to 29 July 2022. Of those that successfully produced a genome, 17% had a BA.2 genome, 13% were BA.4, and 70% were BA.5.

*Border Surveillance*

- In the week ending 24 July, there were 69,902 border arrivals, of whom 88% (61,357) uploaded a RAT result upon arrival. This is similar to 88% in the week prior.
- In the week ending 24 July, 4.8% of recent arrivals tested positive via RAT, an increase from 4.4% in recent weeks.
- Cases in border arrivals have decreased after a steady increase beginning mid-July. By 31 July, there were 200-300 reports per day. In general, the increase trend 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 26%. 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%.

*International and Scientific Insights*

- Globally, in the week ending 31 July 2022, the number of weekly cases increased, with 6.5 million new cases reported after an increasing trend for the past five weeks.
- The number of new weekly deaths remained stable with 14,000 deaths reported.
- Globally, from 1 July to 1 August 2022, 204,668 SARS-CoV-2 sequences were collected and submitted to GISAID. The Omicron VOC remains the dominant variant circulating, accounting for 99% (203,440) of sequences.
- A comparison of sequences submitted to GISAID in the week ending 23 July and the week ending 16 July shows that BA.5 and BA.4 Omicron Descendent lineages continued to be dominant globally, with a weekly prevalence that increased from 63.8% to 69.6% and from 10.9% to 11.8%, respectively. Conversely within the same time period, BA.2.12.1 and BA.2 sequences showed a decline from 4.4% to 1.9% and from 2% to 1.5% respectively.

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- 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*

- Aged Residential Care: As at 03 August, 519 cases were reported in ARC facilities. This has reduced from 649 at 25 July.
- Daily hospital occupancy : As at 03 August, the national daily hospital occupancy metrics show overall ICU/HDU (critical care) occupancy at 68.2%, with 14.4% of ventilators in use, and 90.2% of ward beds occupied.

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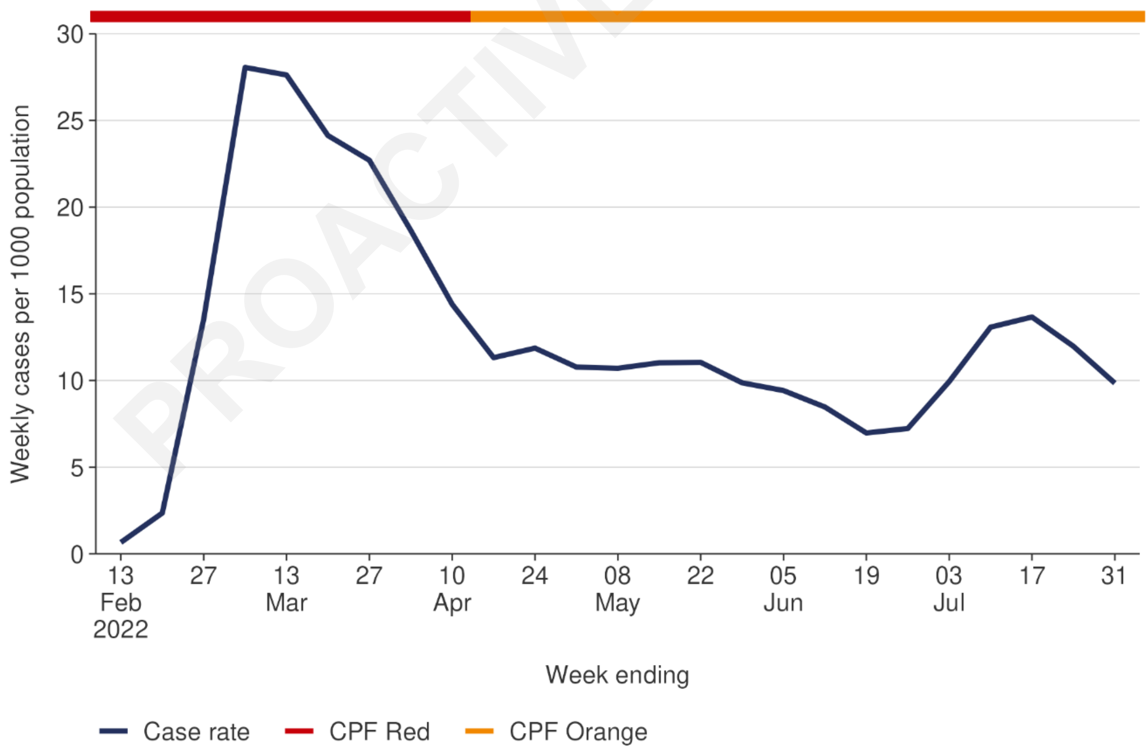
# Domestic epidemic outlook

### 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 (**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.
- Following this, cases increased for four weeks to the week ending 24 July, driven by increasing growth of the BA.5 variant which outcompeted the previous dominant variant BA.2
- Currently, reported community cases have continued to decline for the past three weeks. This decline has also been observed in healthcare workers who undergo routine testing for COVID-19.
- Comparisons of community cases against routine worker testing continue to indicate a substantial under-ascertainment, with approximately half of community cases likely not reported.
- However, wastewater quantification levels contradict overall case trends and indicate that there has been no substantial decrease in new infections across the motu. Levels have plateaued overall. With an increase has been observed in Auckland Metro and Te Manawa Taki regions.
- 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 levels of new infections are likely to remain in the coming weeks.
- Hospitalisations increased by 5.7% and it is highly likely both infections and hospitalisations will continue to increase or decrease slowly, in the coming weeks.

***Figure 1: National weekly case rates and CPF level for 13 February – 31 July 2022***




Source: Éclair/Episurv, 2359hrs 31 July 2022

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## Tertiary Care outlook

- Inpatient test positivity for COVID-19 has plateaued between 40-50 per 1,000 inpatients in the past week.
- Attributable risk analysis indicates, as well as being of an older age, being Māori or Pacific Peoples, being in the most deprived areas or having less than 2 doses of vaccine increases risk for hospitalisation. This is especially true for risk of hospitalisation in those aged under 60 years.
- Continued 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.

## Case ascertainment and data quality issues

- Community case ascertainment is likely to be affected by a number of factors including prior infections, barriers to access and uploading of test results, financial issues from having to isolate, inability to take time off work and not having a place to isolate safely.
- These issues could be exacerbated in areas of higher deprivation and for younger age groups.
- Thus, it could be that some of the difference is explained by deprivation-associated bias in case ascertainment; however, data investigate this not yet available.

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# Infection Trends

**Summary of evidence for infection and case ascertainment trends**

Currently, the healthcare workforce case rates in the past week (19.9 per 1,000) are higher than the general population (9.9 per 1,000). This suggest that the underlying level of infection is substantially higher than diagnosed rates. Case rates in healthcare workers have declined in the past three weeks. These trends are consistent with general population case rates which have also decreased for the past three weeks.

Inpatient test positivity at tertiary hospitals across the motu has tapered further in the last week to 4.2% (42 per 1000) of inpatients testing positive for COVID-19. This trend is similar to the trends above and indicates a decrease of new infections in the community.

However contradictory to case trends, levels of viral RNA in wastewater have plateaued overall. With increases observed in Auckland Metro and Te Manawa Taki and decreases in Central and Te Waipounamu. This indicates that there has been no substantial decrease in the level of new infectious across the motu.

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.

**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 31 July, estimates suggest that 2.0% (676/33,932) of healthcare workers **(Figure 2**) tested positive (for the first time).

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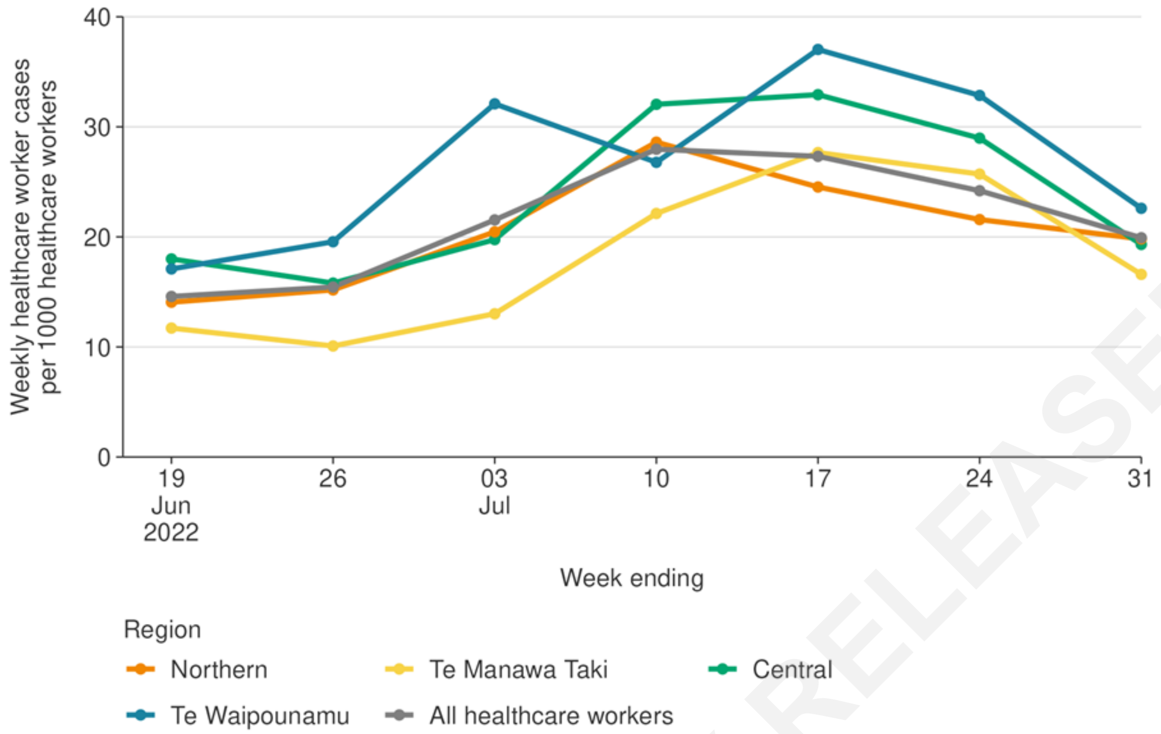
[1] The population has been identified based on surveillance codes used in the healthcare workforce and the presence of previous testing data in 2022. A sensitivity check was run using at least 3 tests and while these numbers reduced, the incidence estimates remained very similar.

***Figure 2: Regional weekly case rates of health care workers for weeks 19 June – 31 July 2022***




Source: Éclair/Episurv, 2359hrs 31 July 2022

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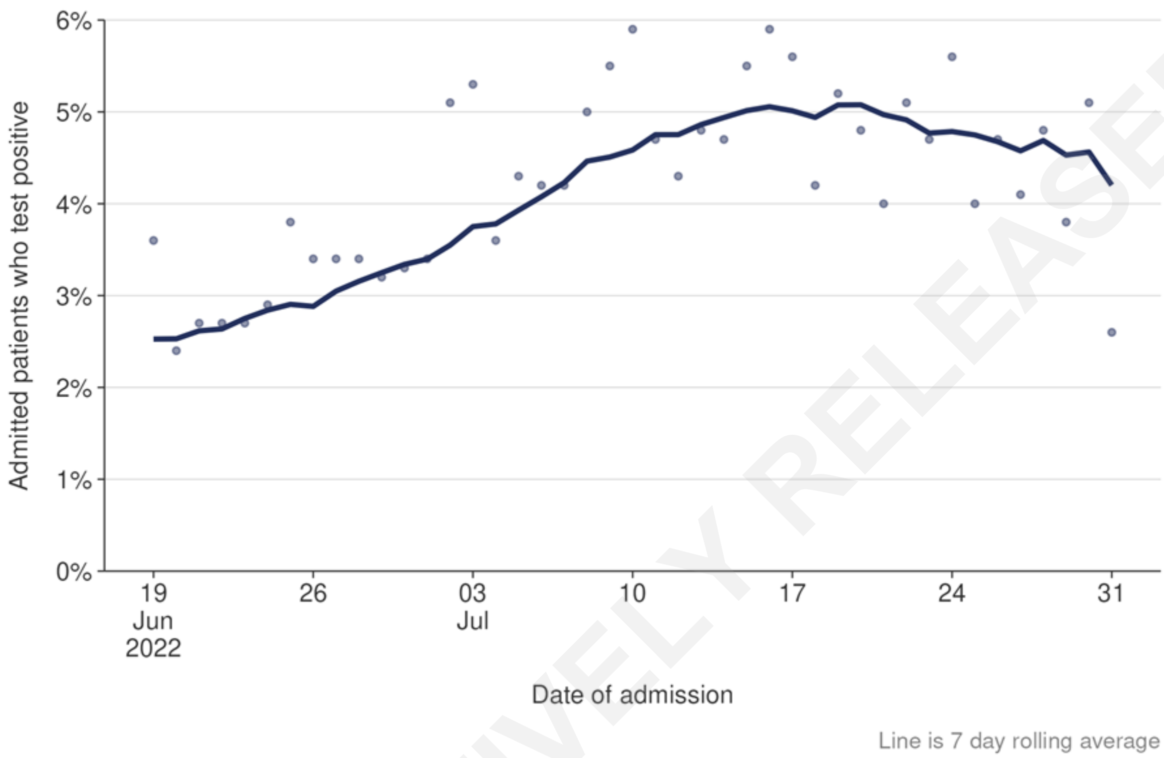
### Test positivity trends among tertiary hospital admissions

Inpatient test positivity trends for tertiary hospital admissions[2] is shown in **Figure 3**. Tertiary hospital admission positivity has tapered with a 7-day rolling average of 4.2% (503/11,969) for the week ending 31 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 31 July 2022

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[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.

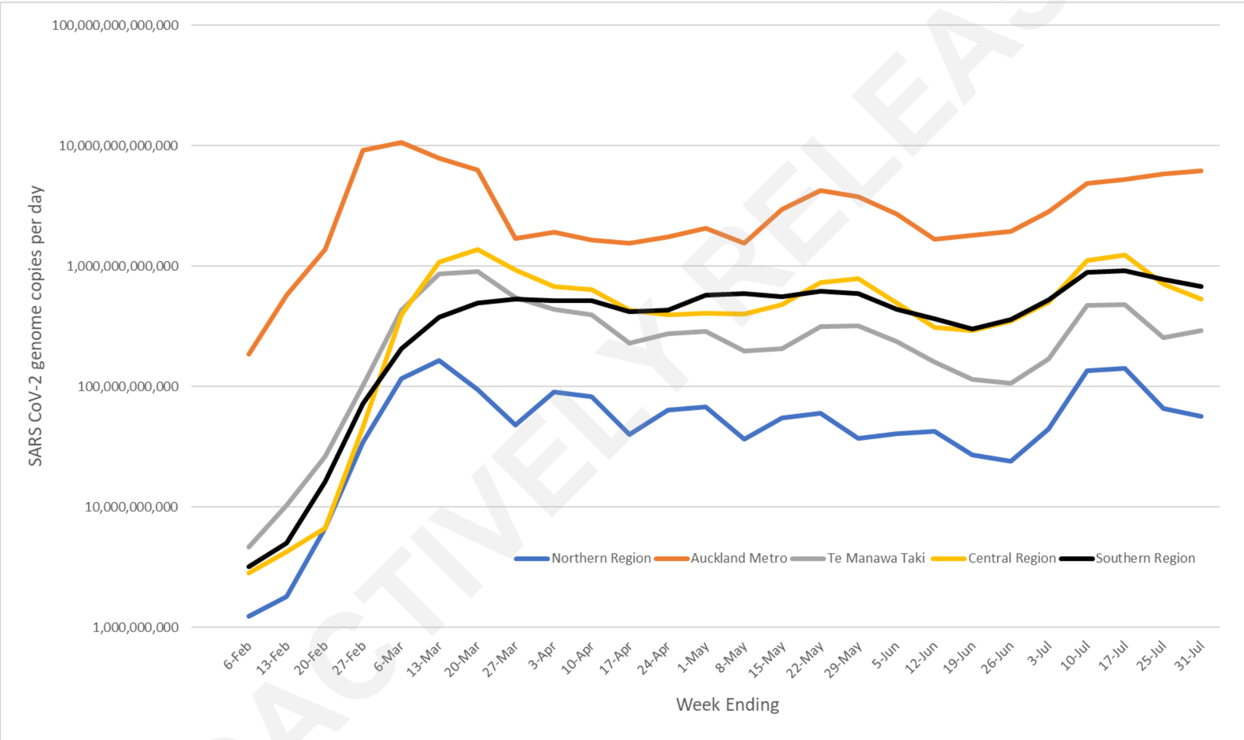
## Wastewater quantification

**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.

Wastewater quantification indicates a mixed trend across the regions, with decreases in Northern, Central and Te Waipounamu (Southern) regions and increases in Auckland Metro and Te Manawa Taki regions compared with the previous week.

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 per day (2-week rolling average) for weeks 06 February – 31 July 2022***




Source: ESR SARS-CoV-2 in Wastewater update for week ending 31 July 2022

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**Trends in diagnosed cases**

Overall, the weekly case rate was 9.8 per 1,000 population for the week ending 31 July. This is a 17.8% decrease from the previous week, which was 12.0 per 1,000.

**Figure 5** shows that case rates have decreased across all regions in the past week. The Northern region rate (8.8 per 1,000) decreased by 13% in the past week, Te Manawa Taki (8.9 per 1,000) decreased by 10%, Central region (11.3 per 1,000) decreased by 23% and Te Waipounamu (11.3 per 1,000) decreased by 23%.

In the past week, all 18 Districts experienced an decrease in case rates. There was a 17% decrease in Counties Manukau, a 9% decrease in Northland, a 12% decrease in Taranaki, a 16% decrease in Lakes, a 16% decrease in Bay of Plenty, a 5% decrease in Waikato, a 30% decrease in Hawke's Bay, a 33% decrease in Wairarapa, a 20% decrease in Whanganui, a 17% decrease in MidCentral, a 24% decrease in Southern, a 23% decrease in Canterbury and West Coast, a 10% decrease in South Canterbury, a 26% decrease in Nelson Marlborough.

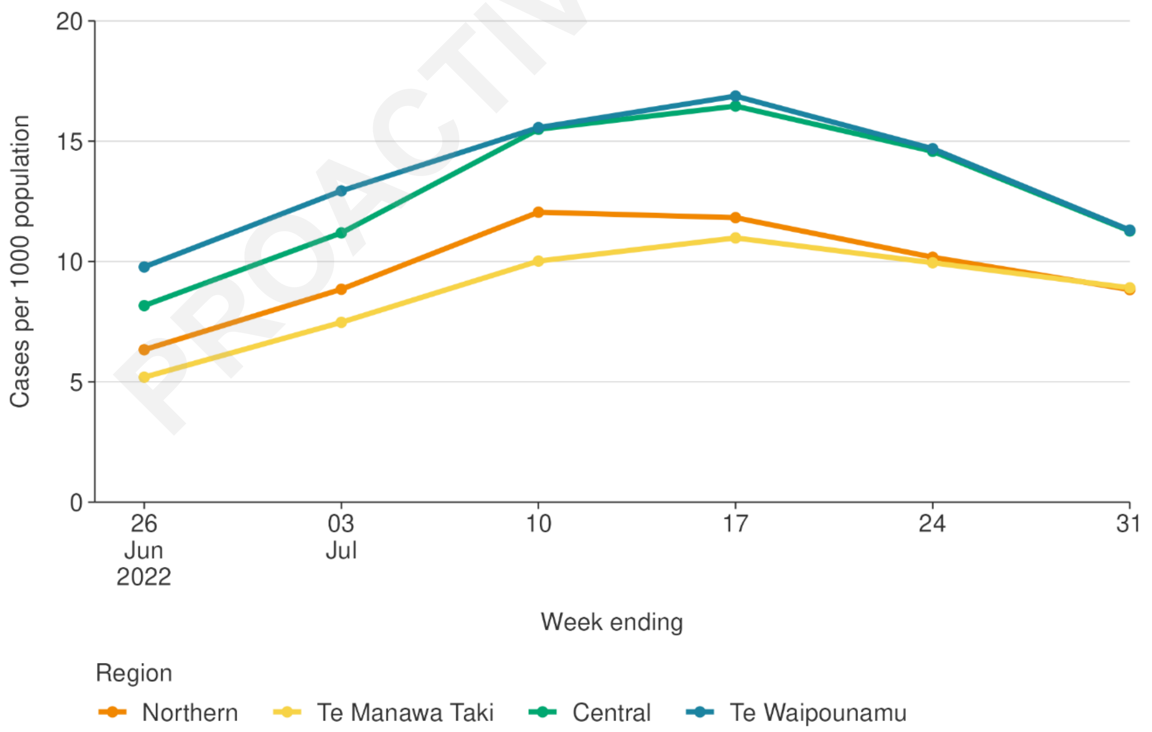
In the Northern region, the weekly case rate was highest for Waitematā (9.5 per 1,000) and Auckland District (9.5 per 1,000).

In Te Manawa Taki, weekly case rates were highest in Taranaki (10.9 per 1,000), followed by Lakes District (9.6 per 1,000).

The highest weekly case rates in the Central region were in Capital, Coast and Hutt Valley (12.0 per 1,000) followed by in Whanganui (11.4 per 1,000).

In Te Waipounamu, the highest case rates were in South Canterbury (12.6 per 1,000) followed by Canterbury and West Coast (11.7 per 1,000).

***Figure 5: Regional weekly case rates for weeks 26 June – 31 July 2022***




Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

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### Reinfection

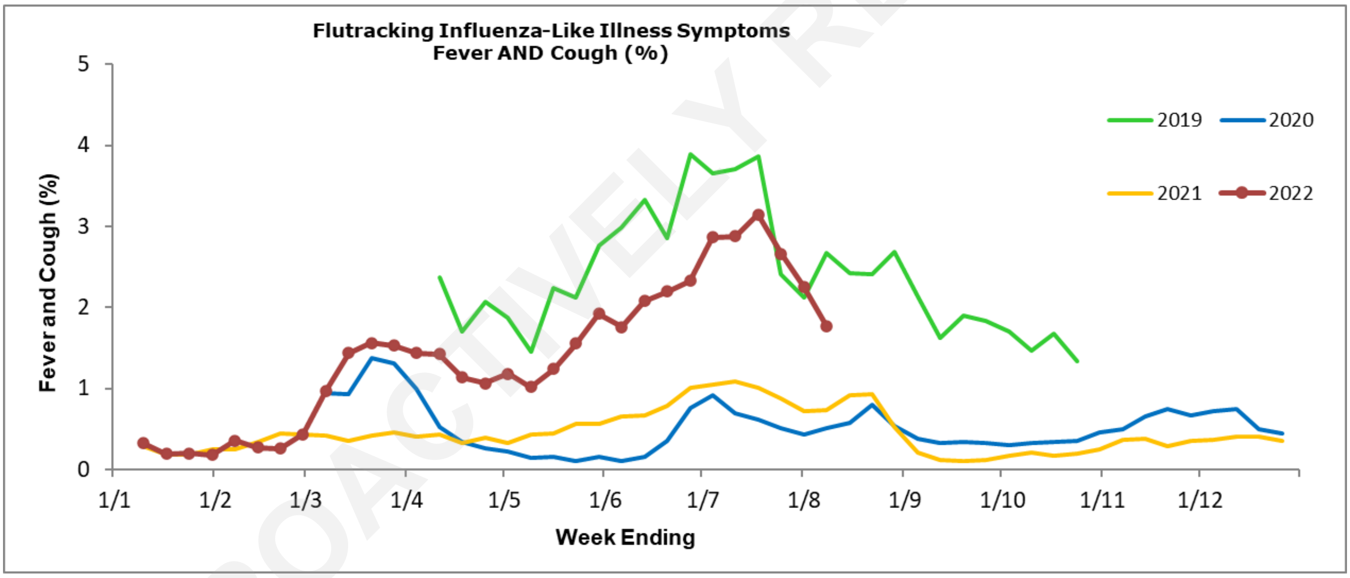
Analysis and interpretation of reinfection data is being developed and will be provided in upcoming reports.

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

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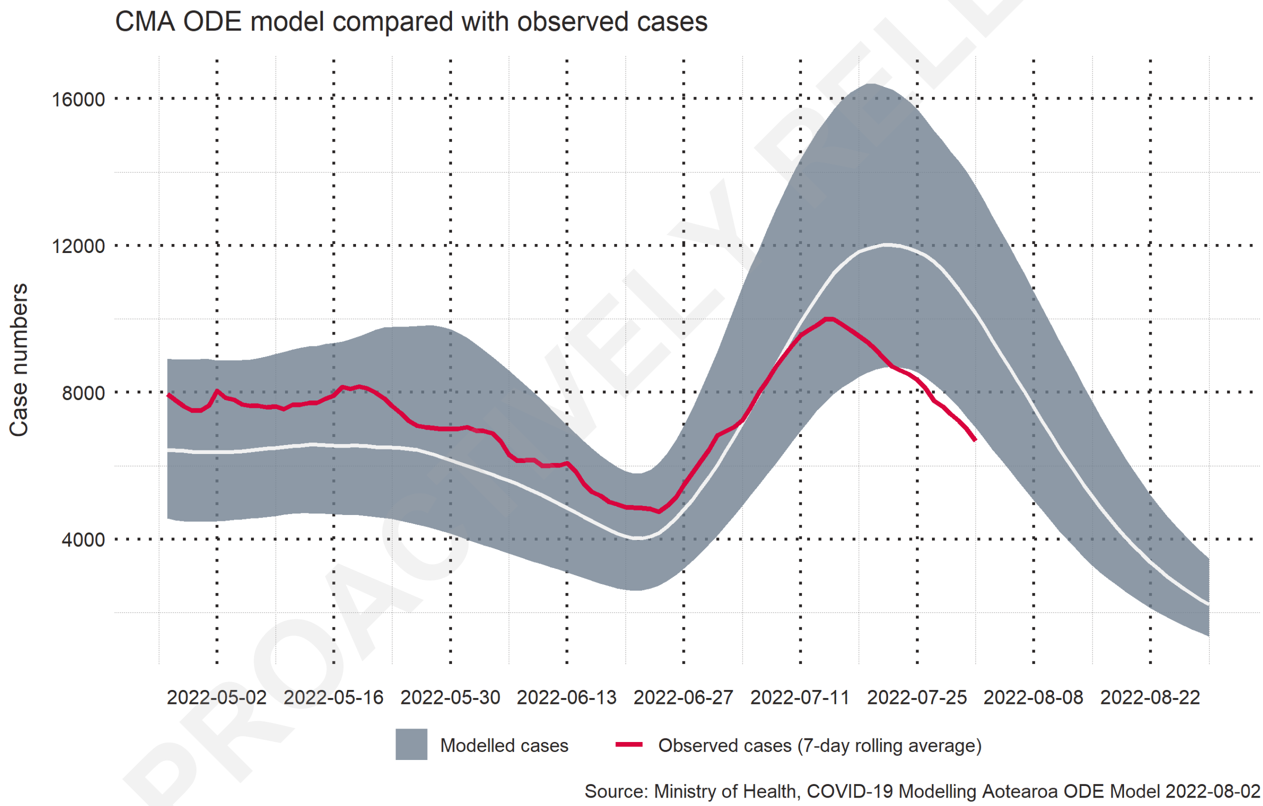
**Modelled and actual cases**

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 new scenario 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)***

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Sources: COVID-19 Modelling Aotearoa Branching Process Model August 2022, and Ministry of Health reported case data 02 August 2022

**Effective reproduction rate, and forecasts of cases and infections**

These estimates used the EpiNow package on 03 August using data to 30 July[3]. The median estimate of **effective R (Reff) nationally is 0.9** (90% Credible Interval [CI]: 0.7-1.1) for cases to 30 July, after adjusting for data lags; this remains similar to 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 30 July 2022 of 4,700 cases per day, with a 50% credible interval of 4,059 – 5,490, to the actual reported cases of 6,232. This was a large underestimation, with the actual number being well outside of the 50% credible interval**.**

The model's median estimate is that national reported cases could be 3,712 cases per day by 06 August (50% credible interval: 3,210 – 4,294). However, the credible intervals for the projected cases would be even wider if the possibility of continuing trend changes in effective R were included.

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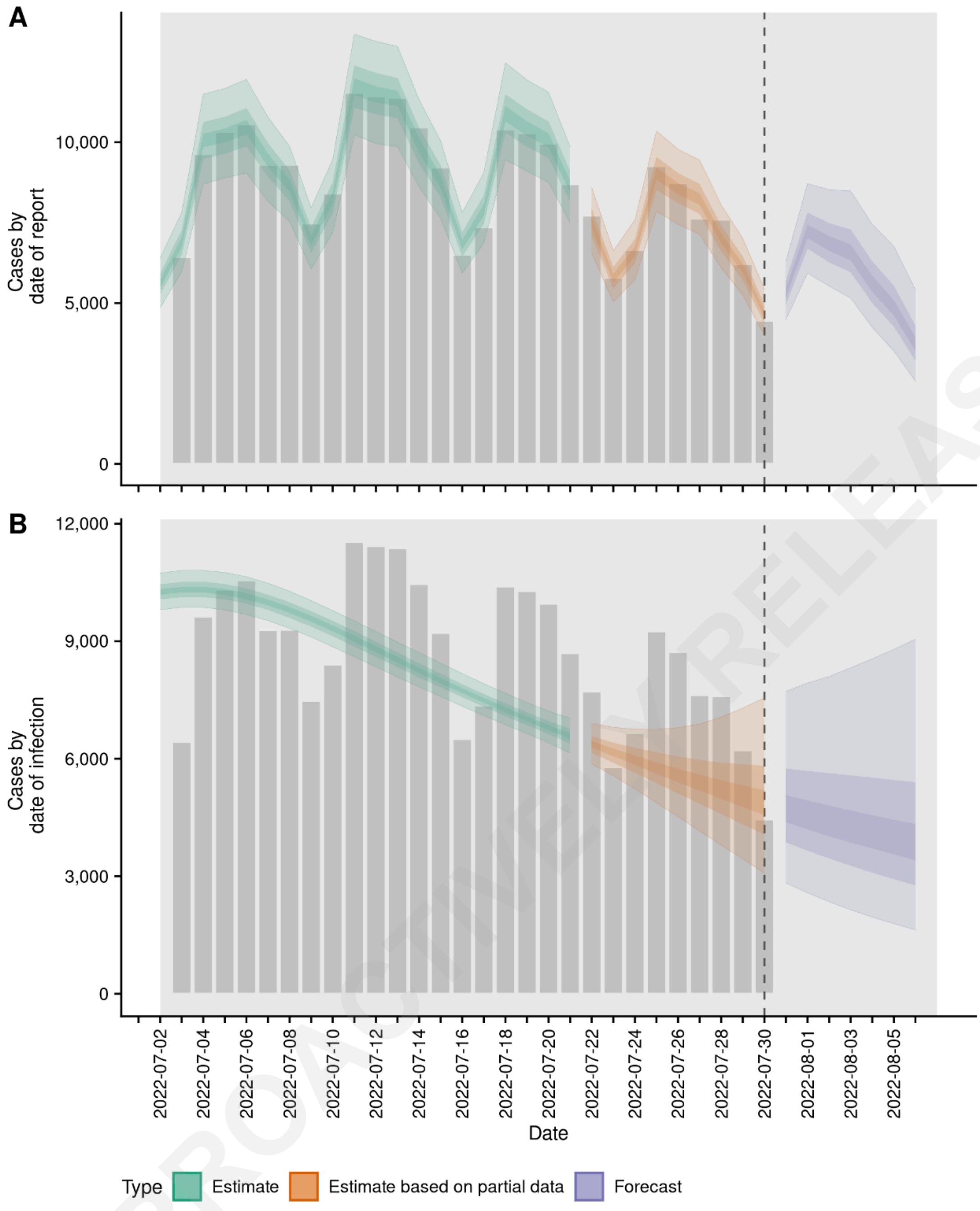
[3] The EpiNow package 'now-casts' and forecasts cases to measure current, past and future transmission nationally by calculating and then extrapolating the effective reproduction number, Reff. The model does not consider several factors that may impact transmission, such as rapid changes in public health 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 30 July 2022, based on NCTS and EpiSurv cases

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# 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 significant 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 10.8 per 1,000 (down from last week's 13.4 per 1,000), followed by Asian at 10.2 per 1,000 (down from 12.4 per 1,000 last week). The lowest case rate continues to be in Pacific Peoples (6.1 per 1,000), which is a 10.7% decrease from last week (6.8 per 1,000). The Māori case rate has also decreased by 11.5%, from 8.0 per 1,000 in the previous week to 7.1 per 1,000.

Case rates in the Northern region were highest for both European or Other and Asian (9.8 per 1,000). Māori had the second lowest case rate at 6.4 per 1,000 and Pacific Peoples (5.8 per 1,000) had the lowest case rates in this region.

Case rates for Te Manawa Taki were highest for European or Other (10.0 per 1,000), followed by Asian (9.7 per 1,000). Pacific Peoples and Maori had the lowest case rates at 6.2 per 1,000.

In the Central region, case rates were highest for European or Other (12.3 per 1,000), compared to Asian (11.3 per 1,000). Māori had the second lowest case rate at 8.3 per 1,000 and Pacific Peoples had the lowest case rate at 6.9 per 1,000.

Case rates for Te Waipounamu were highest for both European or Other and Asian (11.6 per 1,000). Māori had the second lowest case rate at 8.9 per 1,000 and Pacific Peoples had the lowest case rates at 7.1 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 15-24 of Asian ethinicty and 45-64 of European or Other ethnicity (12.5 and 12.4 per 1,000 respectively) whilst the lowest case rates were in those aged 0-4 of Pacific Peoples ethnicity and 5-14 of Māori ethnicity (2.9 and 3.0 per 1,000 respectively). For Māori case rates were highest in the 65+, 45-64 and 25-44 age groups. For 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 45-64, 25-44 and 65+ age groups.

Cases rates for all ethnicities aged 65+ decreased in the past week. In the week ending 24 July, case rates for Asian aged 65+ were 7.3 per 1,000 (29% decrease from week prior). Case rates for European or Other aged 65+ were 11.3 per 1,000 (20.6% decrease from week prior). Case rates in Māori aged 65+ were 10.3 per 1,000 (15.9% decrease from week prior). Case rates in Pacific People aged 65+ were 6.6 per 1,000 (30.8% 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 12.4 per 1,000 and 65+ at 11.3 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.

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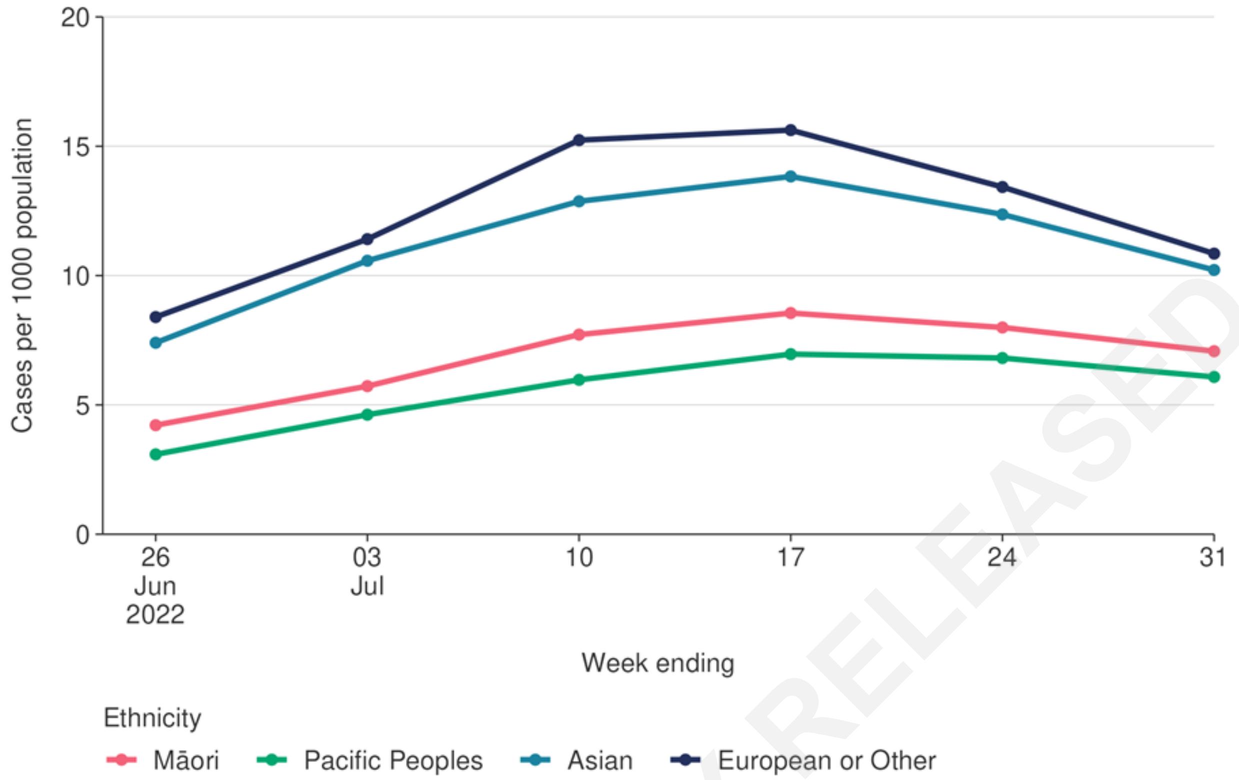
***Figure 9: National weekly case rates by ethnicity for weeks 26 June – 31 July 2022***




Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

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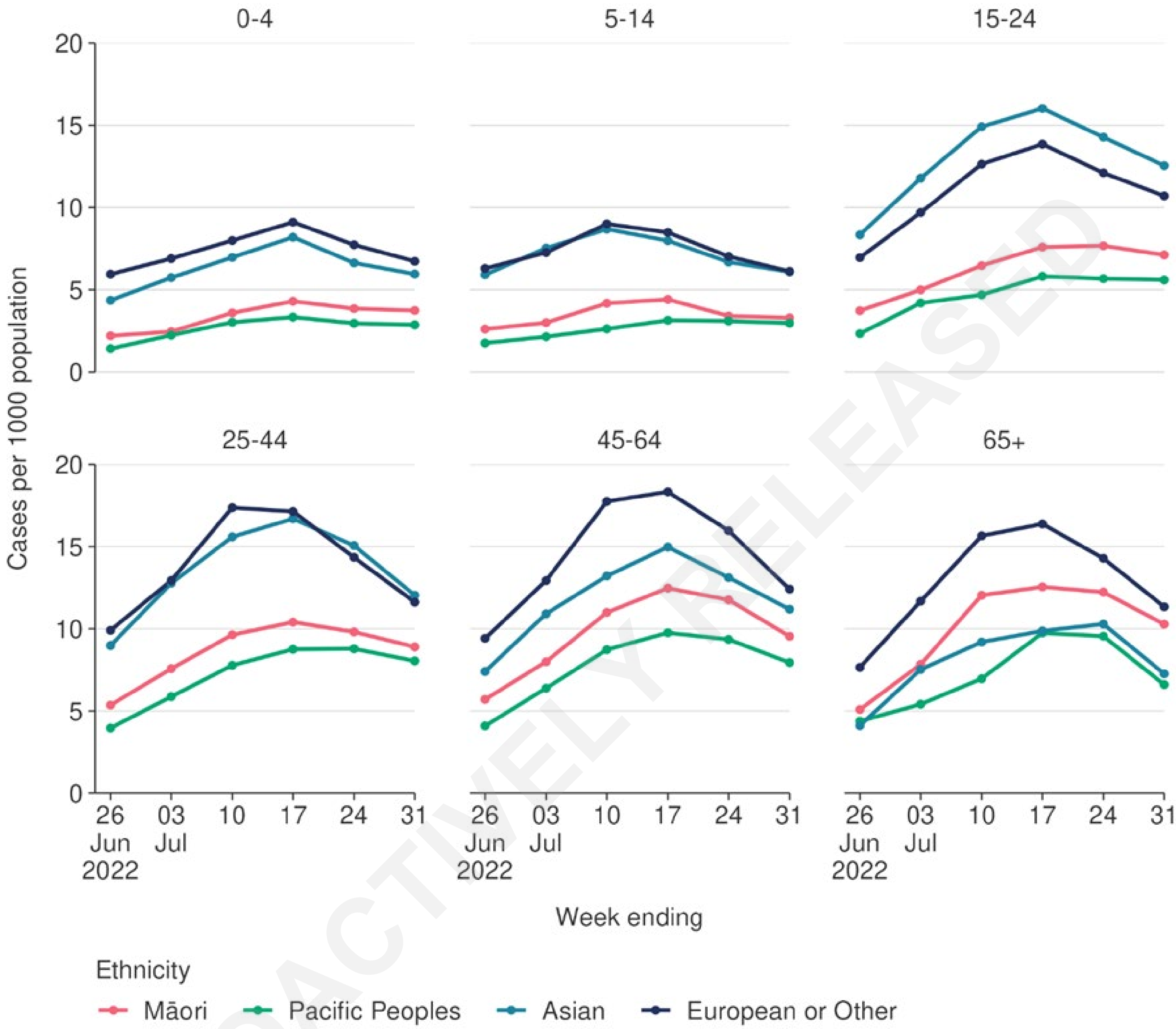
***Figure 10: National ethnicity-specific weekly case rates by age group for weeks 26 June – 31 July 2022***




Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

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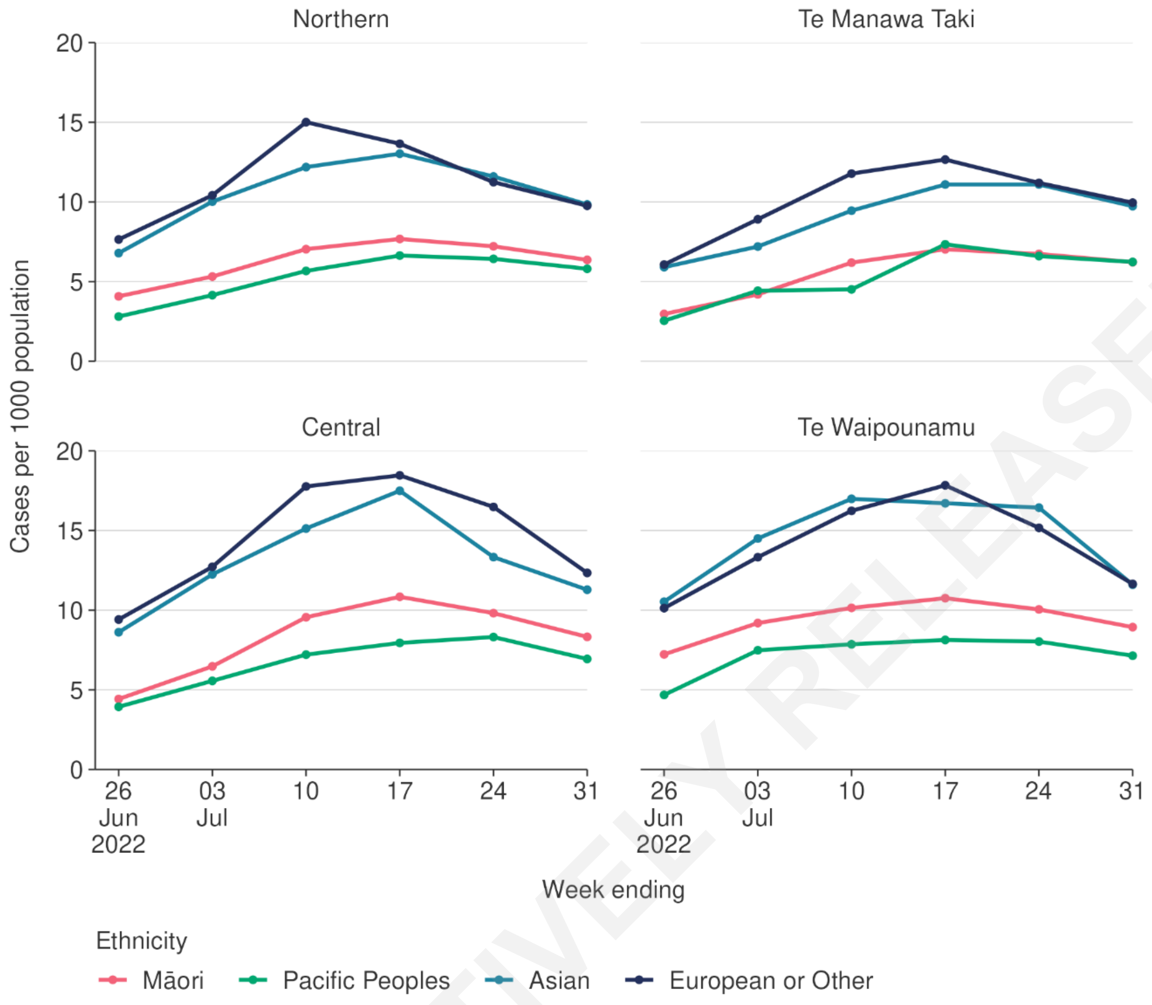
***Figure 11: Regional weekly case rates by ethnicity for weeks 26 June – 31 July 2022***




Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

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### 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 21.2% from last week to 10.8 per 1,000.

Nationally, case rates were relatively similar for 0-4 and 5-14 age groups (5.4 and 5.1 per 1,000 respectively). The case rate for the 15-24 age groups was 9.6 per 1,000; The 25-44 age group had the second highest case rate at 11.1 per 1,000; The 45-64 age groups had the highest case rates at 11.7 per 1,000 in the past week; Those aged 5-14 had the lowest weekly case rate at 5.1 per 1,000.

For the 0-4 age group, case rates in the Northern region decreased by 12.8%, Te Manawa Taki increased by 2.6%, Central decreased by 12% and Te Waipounamu decreased by 15.4%.

For the 5-14 age group, case rates in the Northern region decreased by 8.9%, Te Manawa Taki increased by 1%, Central decreased by 15% and Te Waipounamu decreased by 14.6%.

For the 15-24 age group, case rates in the Northern region decreased by 3.9%, Te Manawa Taki increased by 4.4%, Central decreased by 12.6% and Te Waipounamu decreased by 24.3%.

For the 25-44 age group, case rates in the Northern region decreased by 12.2%, Te Manawa Taki decreased by 14.5%, Central decreased by 23.5% and Te Waipounamu decreased by 21.3%.

For the 45-64 age group, case rates in the Northern region decreased by 14.8%, Te Manawa Taki decreased by 15.1%, Central decreased by 27.9% and Te Waipounamu decreased by 25%.

For the 65+ age group, case rates in the Northern region decreased by 22.6%, Te Manawa Taki decreased by 10.2%, Central decreased by 22.5% and Te Waipounamu decreased by 25.5%.

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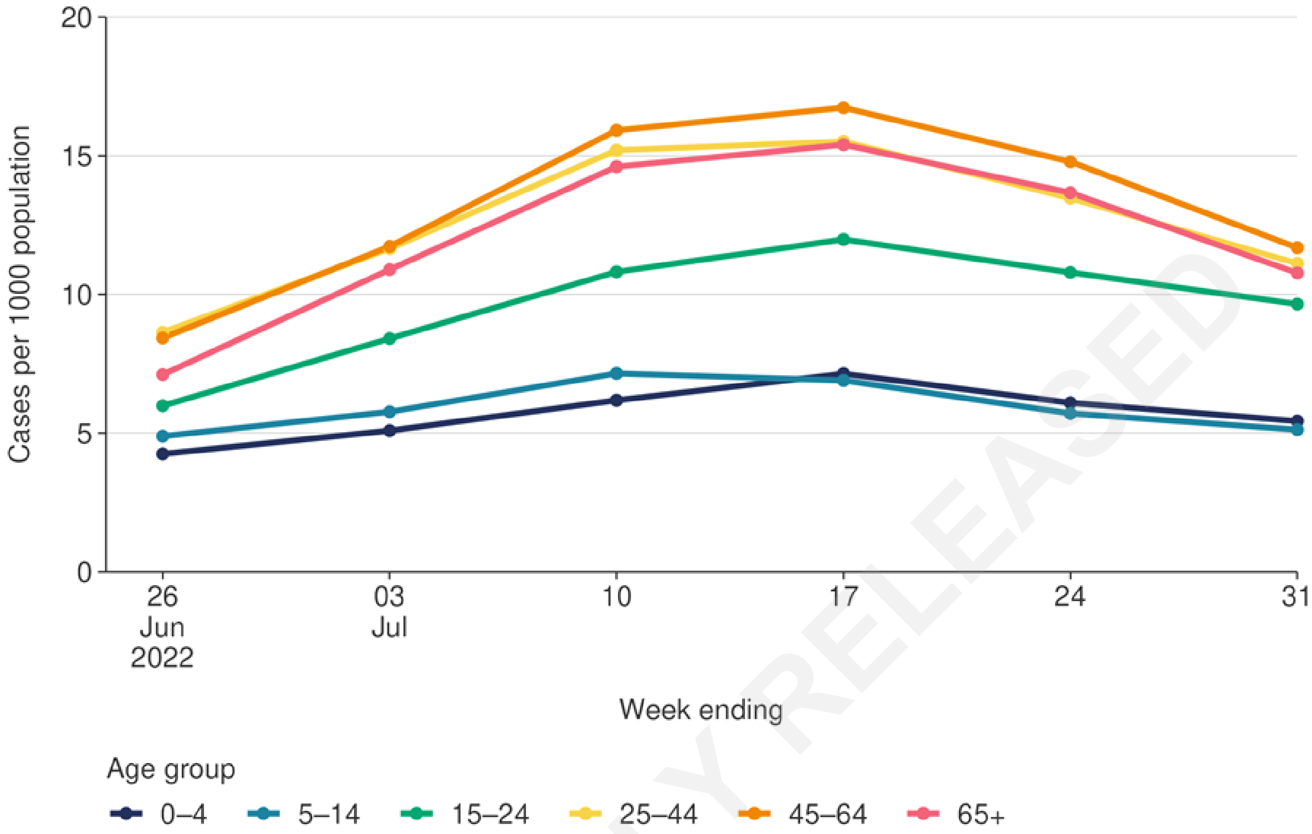
*Figure 12: National weekly case rates by age for weeks 26 June - 31 July 2022*




Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

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## 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 (11.1 per 1,000 population), followed by areas of mid-range deprivation (10.2 per 1,000) and most deprived areas (8.5 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 to investigate this is not currently available. 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 (10.7 and 10.3 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 11.4 per 1,000 followed by Asian (10.5 per 1,000).

For the most deprived areas, Māori made up 20.3% 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 9.8%, for Asian 15.9% and for European and Other, 54.1%. Following this, 79% of cases in areas of least deprivation were European and Other compared with 14.1% Asian, 6.6% Māori and 2.2% Pacific Peoples.

In the Northern region, case rates were highest in the least deprived areas (9.7 per 1,000 population) followed by areas of mid-range deprivation (9.6 per 1,000) and areas most deprived (7.2 per 1,000).

In Te Manawa Taki, case rates were highest in the least deprived areas (10.5 per 1,000) followed by areas of mid-range deprivation (8.8 per 1,000) and areas most deprived (8.3 per 1,000).

In the Central region, case rates were highest in the least deprived areas (12.6 per 1,000) followed by areas of mid-range deprivation (11.9 per 1,000) and areas most deprived (9.4 per 1,000).

In Te Waipounamu, case rates were highest in the least deprived areas (12.3 per 1,000) followed by areas of mid-range deprivation (11.0 per 1,000) and areas most deprived (10.7 per 1,000).

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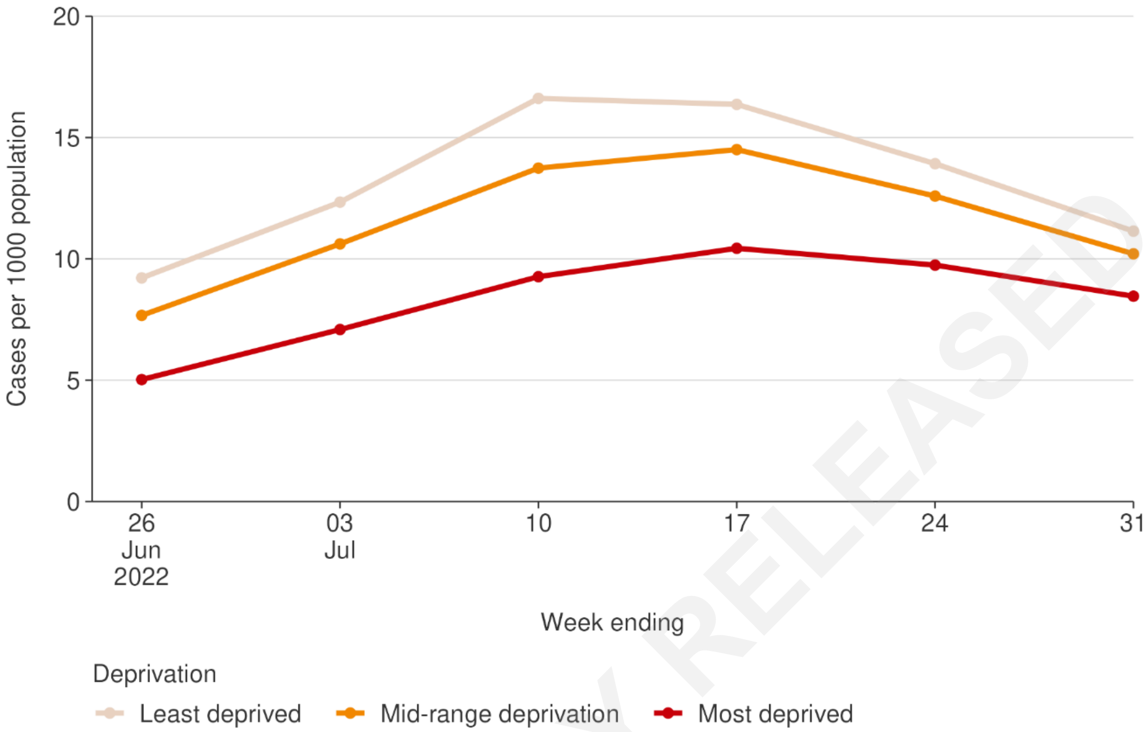
[4] Contents (otago.ac.nz)

*Figure 13: National weekly COVID-19 case rates by deprivation status for weeks 26 June – 31 July 2022*




Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

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### Vaccination trends over time

This section has been removed this week. Please see hospitalisation and mortality rates by vaccination in the Hospitalisation and Mortality section.

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# 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 BA.5 variant of Omicron remains the 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).

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 76% 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 very small number of recent subvariant BA.2.75 continue to be detected in the community and border with four cases reported in the two weeks since 16 July. 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.

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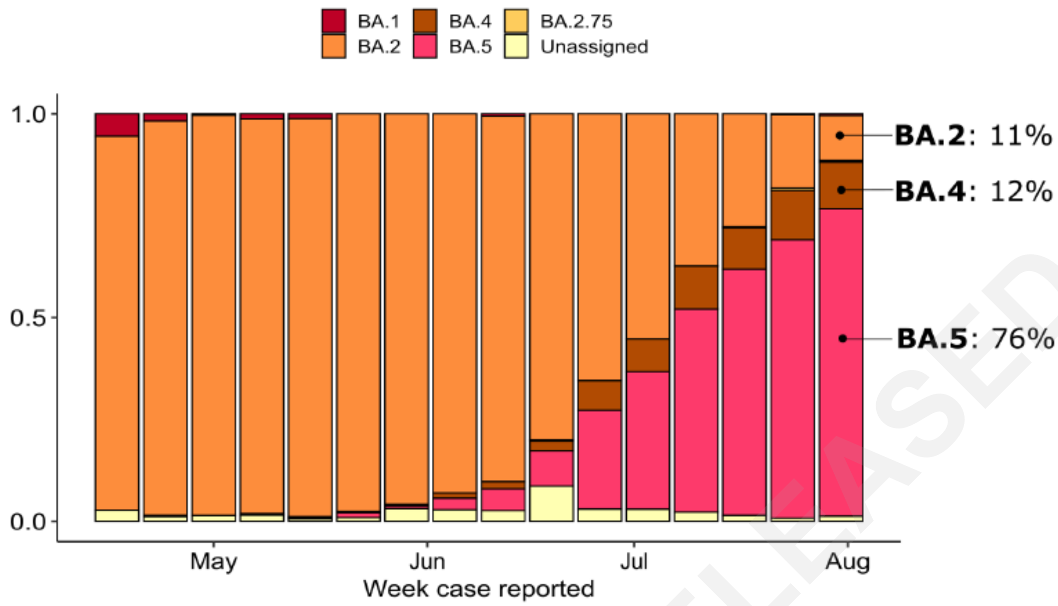
*Figure 14: Frequency of Variants of Concern in community cases in New Zealand*




Source: ESR COVID-19 Genomics Insights Report #18, EpiSurv/Microreact 0900hrs 01 August 2022

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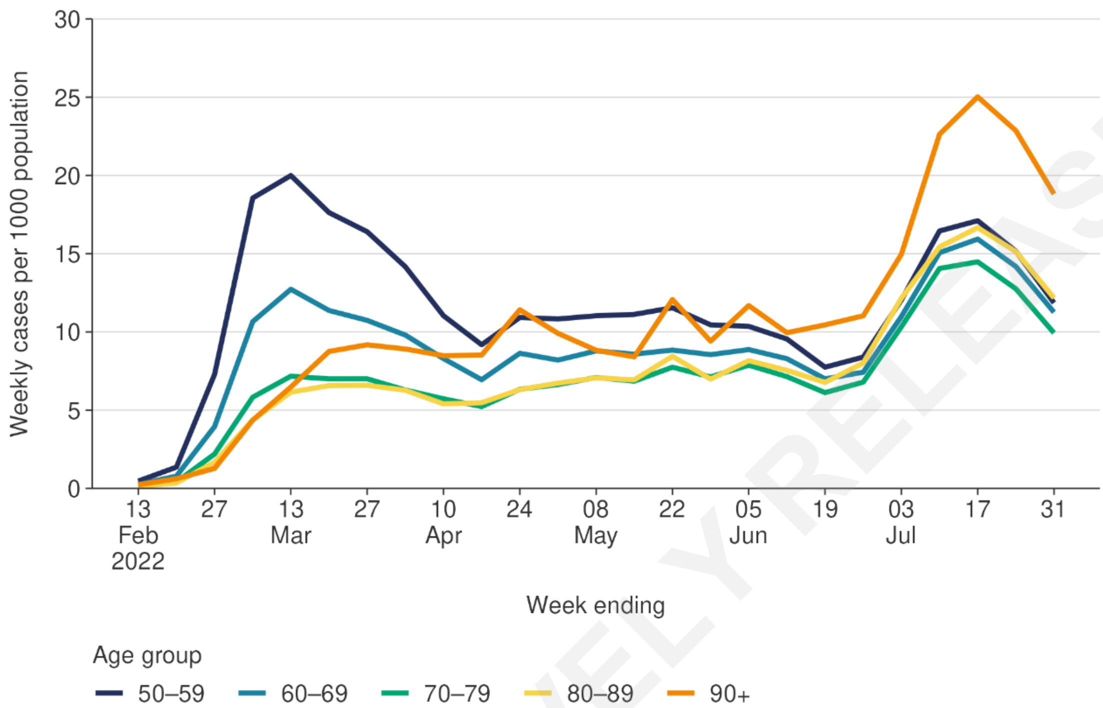
# Hospitalisation and Mortality

Hospitalisation and mortality risk is strongly linked with increasing age; there have been decreases in case rates in those aged over 60 years during the past 2 weeks (**Figure 15**), and consequently a steady rise in the weekly numbers of deaths in the past month (see **Figure 24**).

***Figure 15: Case rates (per 1000) in those aged over 50 years, 13 February to 31 July 2022***

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Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

### Hospital Admissions Rates

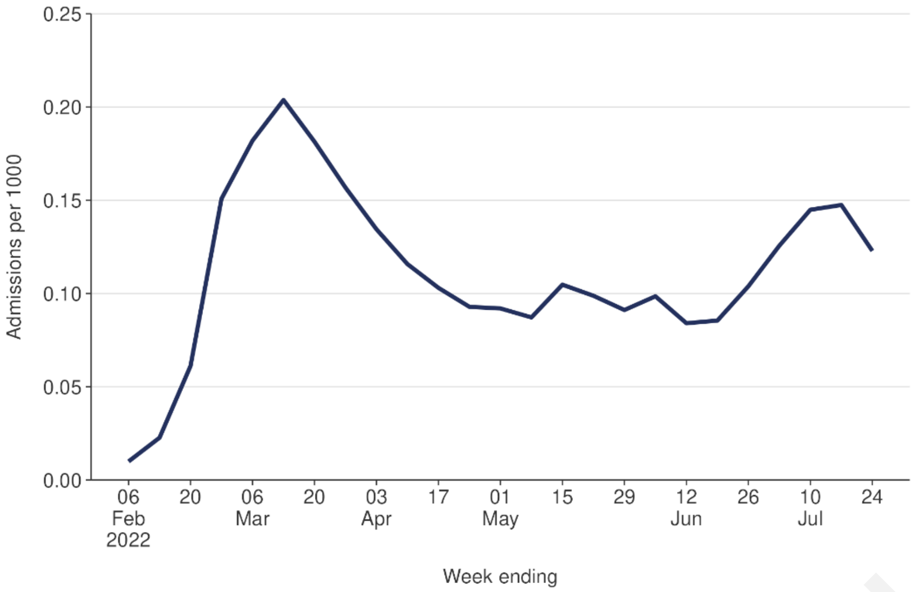
This is new hospital admission data that comes from a combination of two data sources - the inpatient admission (IP) dataset (which only includes data from hospitals in certain regions) and the National Minimum Dataset (NMDS), which is a more detailed and complete dataset that is only consistently available a couple of months after discharge. 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 16**, the COVID-19 hospital admissions rate[5] decreased in the week ending 24 July.

Hospital admission rates by age group (**Figure 17**) was 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.

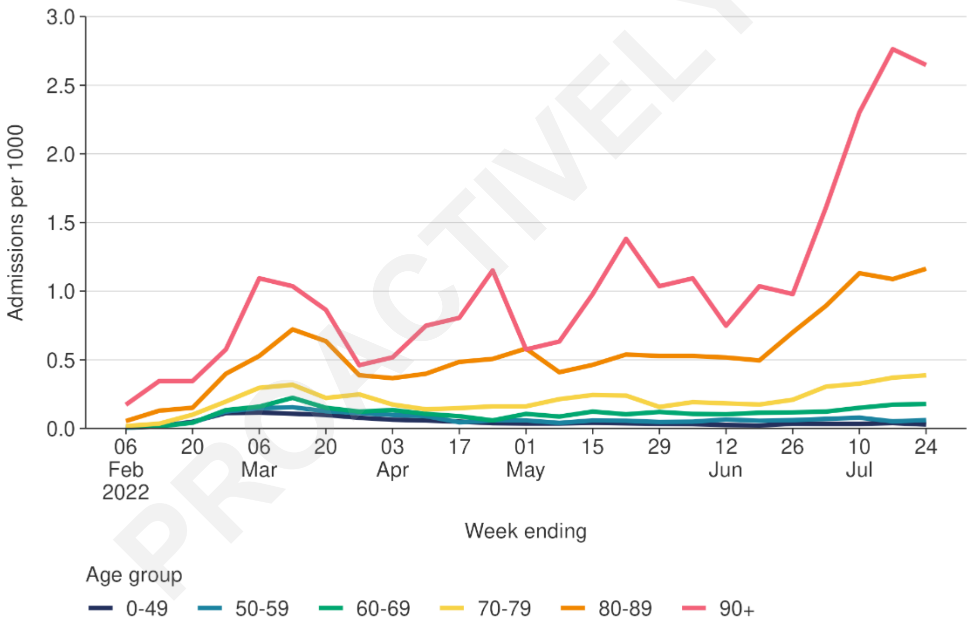
[5] New hospital admissions who had COVID at the time of admission or while in hospital; excluding hospitalisations that were admitted and discharged within 24hrs. This data is from districts with tertiary hospitals, the districts are Auckland, Canterbury, Southern, Counties Manukau, Waikato, Capital & Coast, Waitematā and Northland.

***Figure 16: COVID-19 hospital admissions rate per 1,000, 06 February to 24 July 2022***




Source: NMDS/Inpatients admissions feed, 24 July 2022

***Figure 17: Hospital admission rates by age group, 06 February to 24 July 2022***




Source: NMDS/Inpatients admissions feed, 24 July 2022

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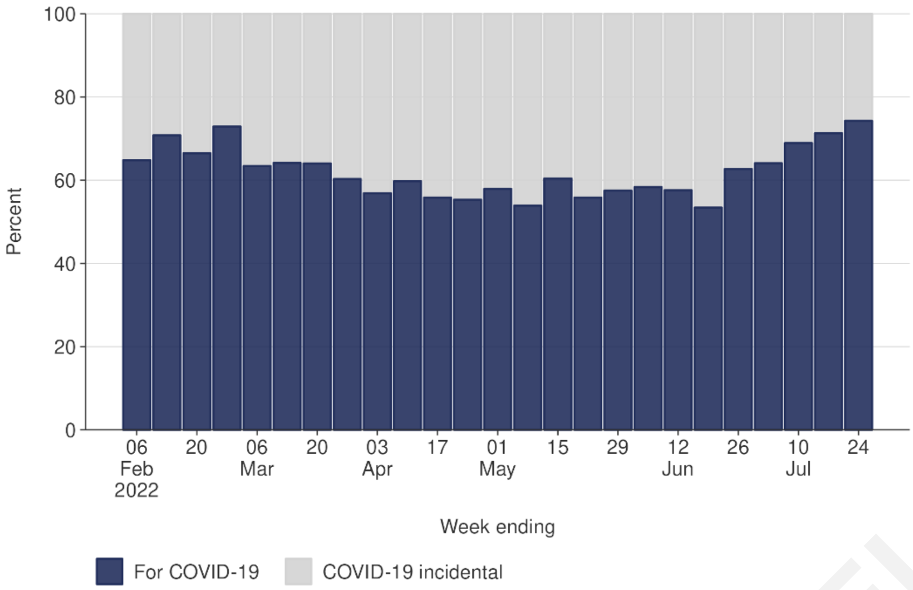
### Hospital admissions *For* vs *Incidental for COVID-19*

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. The '*For*' measure excludes those who are identified as incidental. Recent trends are subject to revision. 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 was 74% for the week ending 24 July 2022 (**Figure 18**).

***Figure 18: Percentage of Hospital admission for vs Incidental for COVID-19, 06 February – 24 July 2022***




Source: NMDS/Inpatients admissions feed, 24 July 2022

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**Hospitalisation Risk**

Unadjusted and age-adjusted risk: Disparities in hospitalisation risk by ethnicity, deprivation and vaccination are clearly observed after adjusting (age-standardising[6]) 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, deprivation and vaccination can be masked. Therefore, the hospitalisation risk for these communities must be adjusted for age in order to make an accurate comparison.

**Figure 19-21** show age-standardised rates of hospitalisation with COVID-19 broken down by ethnicity, deprivation and vaccination, for the time period of March 2020 to 31 July 2022. Rates are standardised to the Māori 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.

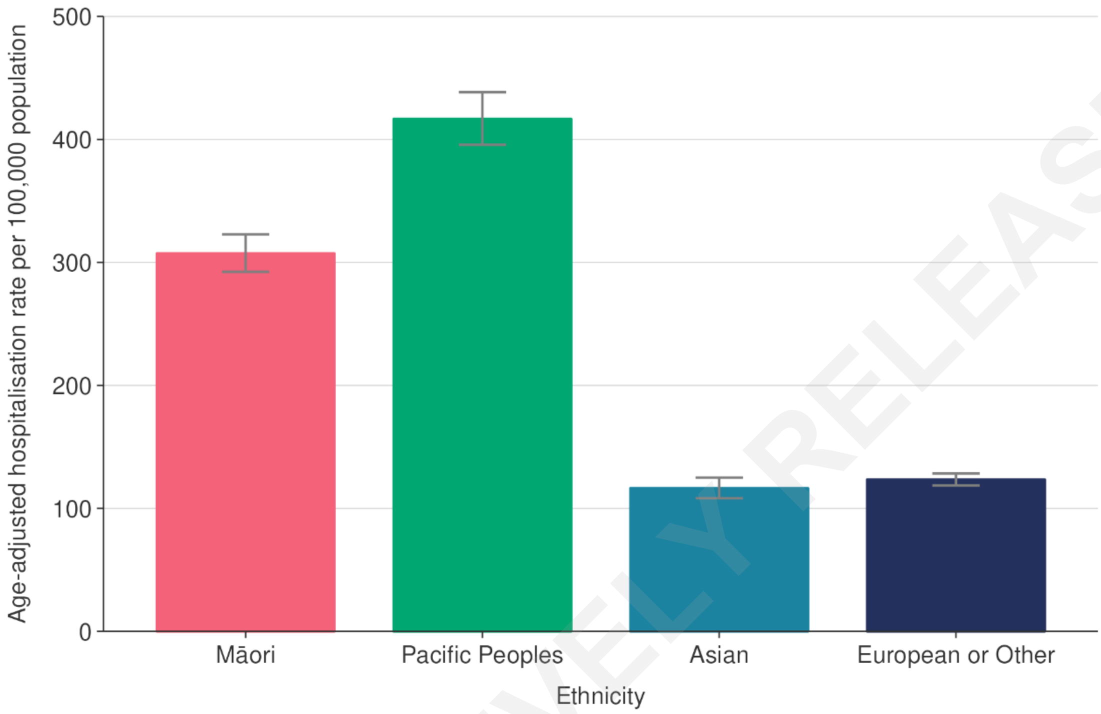
Pacific Peoples had the highest cumulative incidence rate of hospitalisation with COVID-19 which was 1.4 times higher than Maori ethnicity, 3.4 times higher than European or Other ethnicity and 3.6 times higher than Asian Peoples (**Figure 19**).

The most deprived areas had the highest rate of hospitalisation with COVID-19 (269.6 per 100,000) followed by areas of mid-range deprivation (145.5 per 100,000) and the least deprived areas (101.6 per 100,000) **(Figure 20**).

[6] 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 Maori population.

Hospitalisation rate for people with more than 2 doses (96 per 100,000) was significantly lower compared to people with 2 or less doses.The hospitalisation rate for those with more than 2 doses was 2.5 times lower than those with 2 doses and 2.9 times lower than those with less than 2 doses. The difference in hospitalisation rate between people with 2 doses and people with less than 2 doses was also statistically significant (**Figure 21**).

***Figure 19: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation with COVID-19 by ethnicity, March 2020 to 31 July 2022***




Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, March 2020 to 31 July 2022

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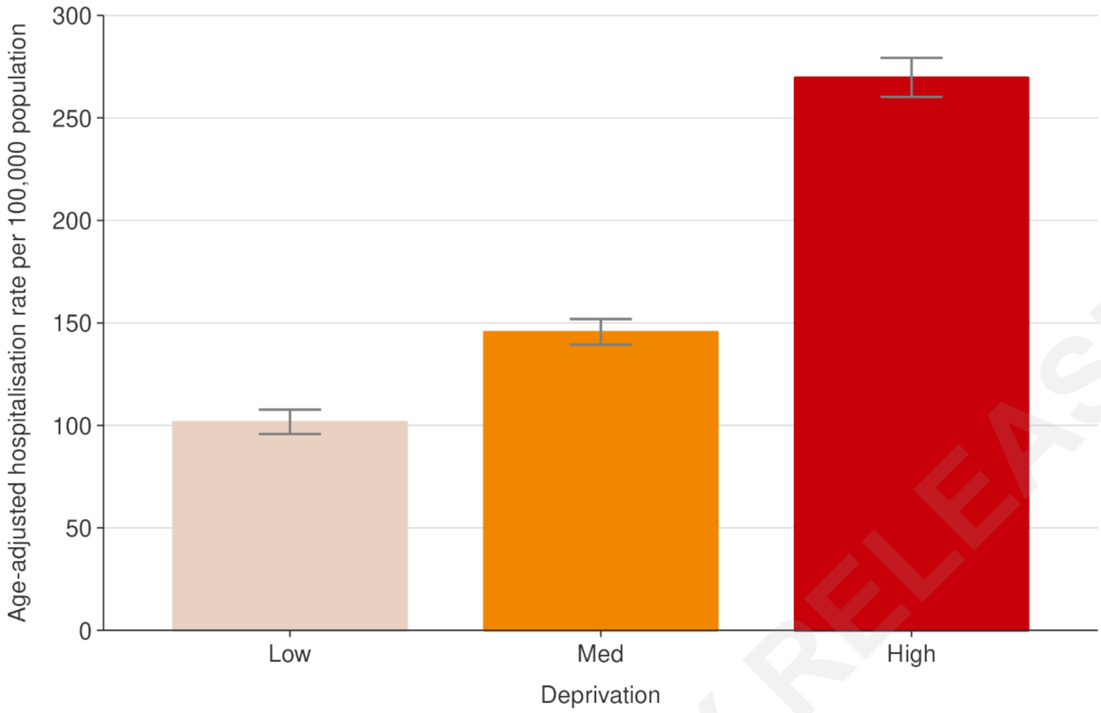
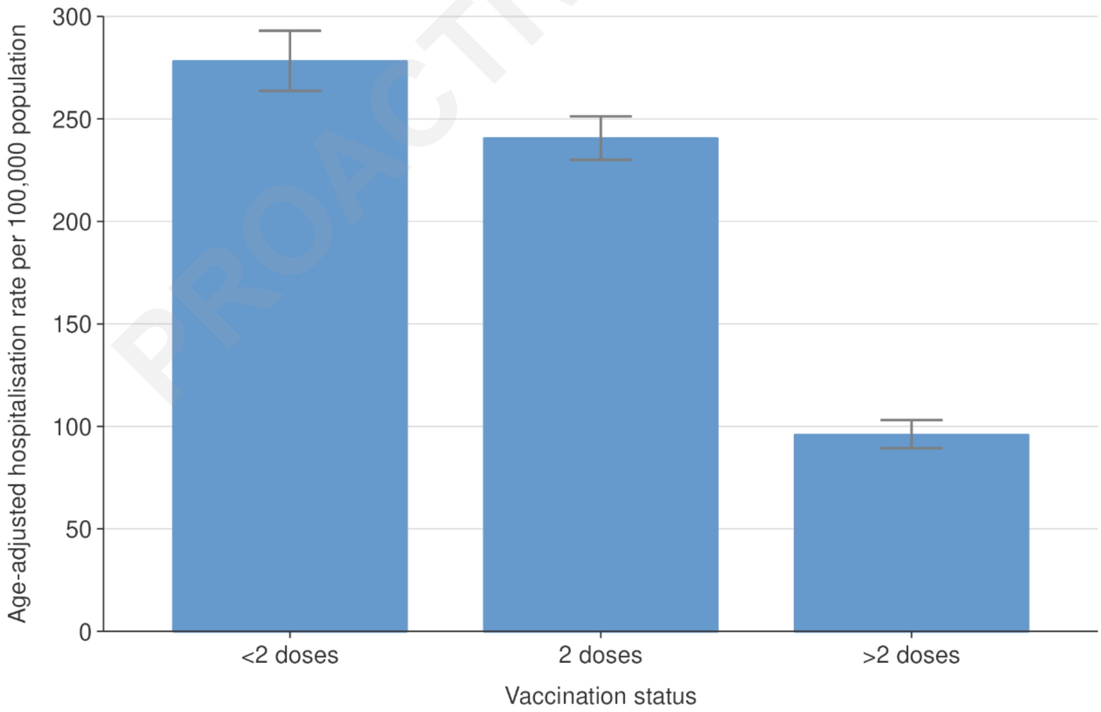
***Figure 20: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation with COVID-19 by deprivation, March 2020 to 31 July 2022***




Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, March 2020 to 31 July 2022

***Figure 21: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation with COVID-19 by vaccination status, March 2020 to 24 July 2022***




Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, March 2020 to 31 July 2022

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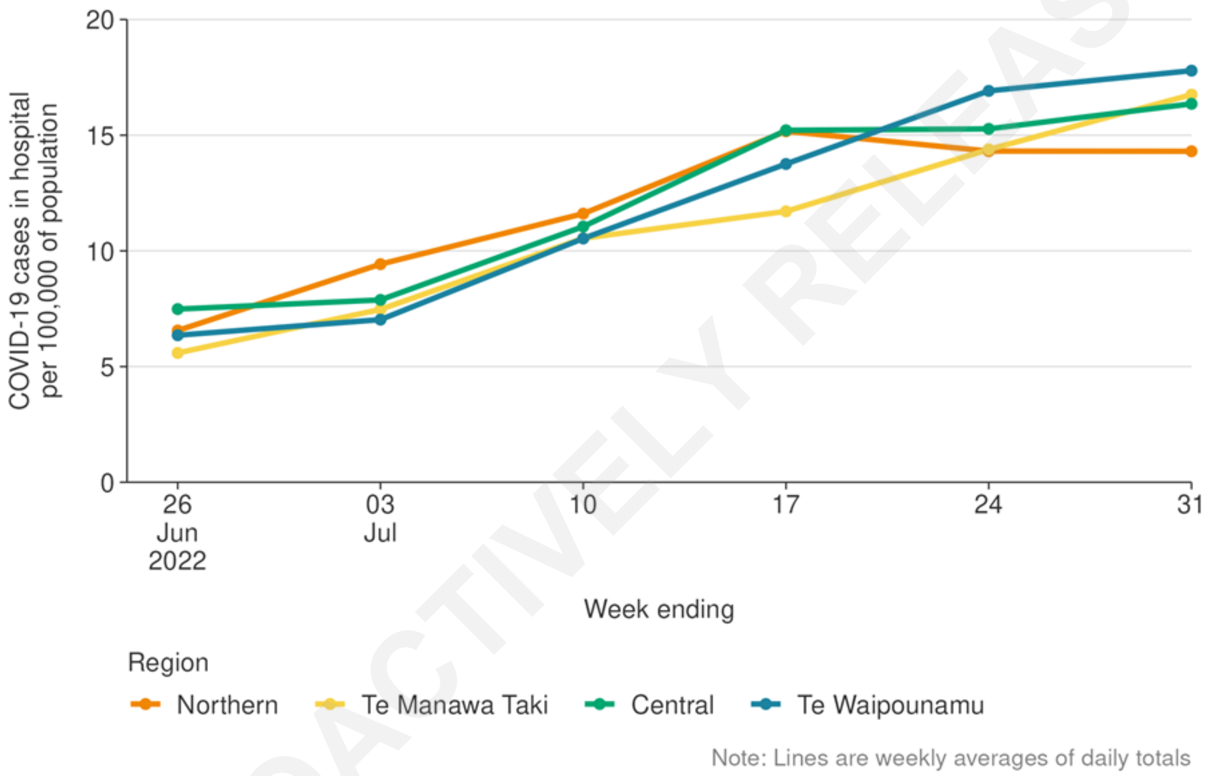
**Hospital Occupancy**

For the week ending 31 July, the national daily average hospital occupancy for inpatients with COVID-19 was 16.0 per 100,000 population, an increase of 5.7% from the week prior (**Figure 22**).

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) remained the same, Te Manawa Taki (16.8 per 100,000) increased by 16.5%, Central region (16.4 per 100,000) increased by 7.1% in the past week and Te Waipounamu (17.8 per 100,000) increased by 5.2%.

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

***Figure 22: Regional daily hospital occupancy averaged per week, 26 June – 31 July 2022***




Source: Daily hospital questionnaire as of 31 July 2022

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### Whole Genomic Sequencing of hospitalised cases

As of 01 August, ESR received samples from and had processed 245 of the 790 PCR positive hospital cases with a report date in the two weeks to 29 July 2022. Of those that successfully produced a genome, 17% had a BA.2 genome, 13% were BA.4, and 70% 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.

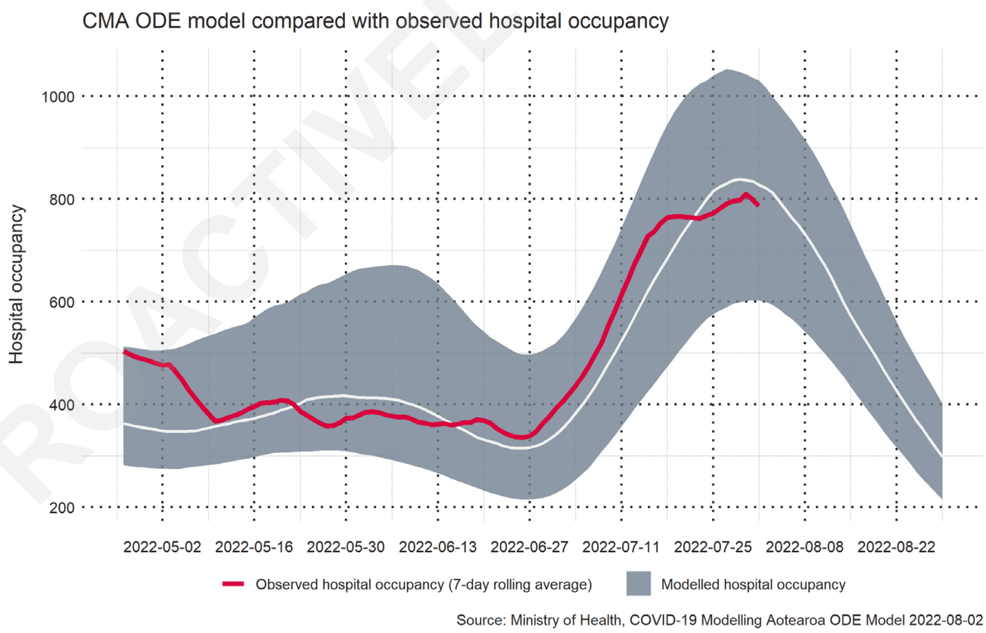
### Modelled and actual hospital occupancy rate

The COVID-19 Modelling Aotearoa group's modelling scenarios track beds occupied by people with COVID-19 infections. **Figure 23** 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 prediction.

***Figure 23: COVID-19 Modelling Aotearoa hospital occupancy scenarios compared to actual hospital occupancy***




Sources: COVID-19 Modelling Aotearoa (CMA) Branching Process Model August 2022, hospital occupancy (all COVID-19 positive people admitted as inpatients) as of 02 August 2022.

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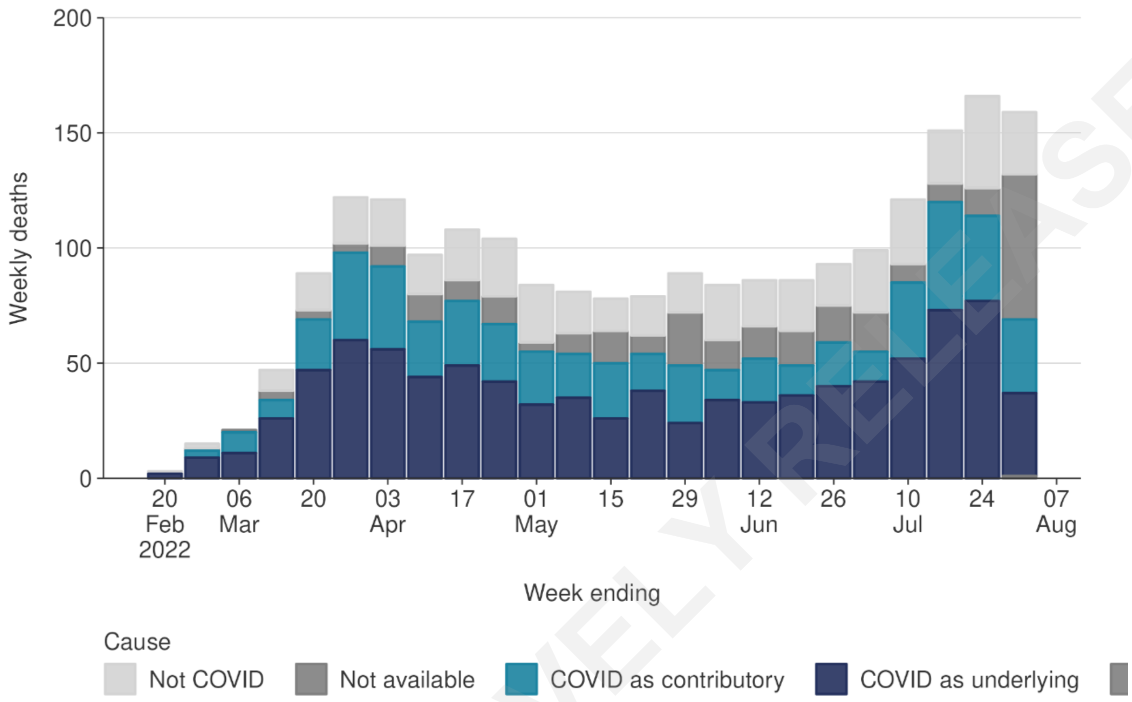
## Mortality

From March 2020 to 31 July 2022, there were 2,321 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, 1,034 (49%) were determined to have COVID-19 as the main underlying cause. COVID-19 contributed to a further 569 (27%) deaths, another 486 (23%) people died of a separate, unrelated cause.

***Figure 24: Weekly death counts by cause of death, 20 February to 31 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.*

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### *Comparisons in COVID-19 Mortality*

Unadjusted and age-adjusted risk: Disparities in mortality risk by ethnicity, deprivation and vaccination 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.

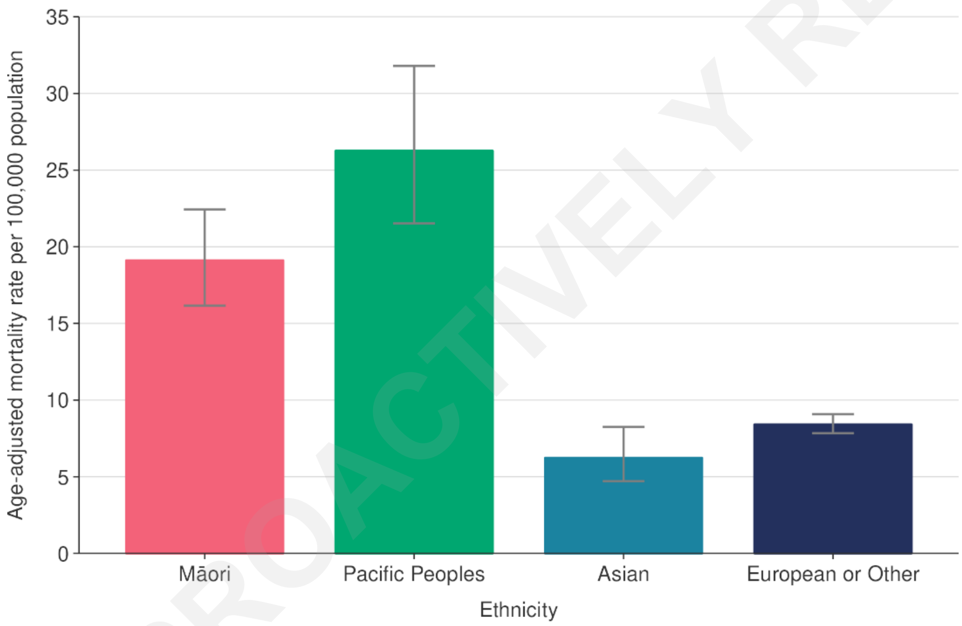
**Figure 25 – 27** show age-standardised rates of mortality with COVID-19 broken down by ethnicity, deprivation and vaccination, for the time period of March 2020 to 31 July 2022. Rates are standardised to the Māori population age structure. **Non-overlapping confidence intervals between any two groups suggests the difference between those two groups is statistically significant.** Data includes all deaths attributed to Covid-19.

**Figure 25** shows that for total COVID-19 attributed mortality rates by ethnicity, Pacific Peoples had the highest rate which was 1.4 times higher than Māori ethnicity, 3.1 times higher than European or Other ethnicity and 4.2 times higher than Asian ethnicity. Confidence intervals overlapped between Māori and Pacific People; and between Asian and European or Other, which suggests that the difference in mortality rates between those groups is not significant. Mortality rates for Asian and European or Other are significantly lower than mortality rates for Māori and Pacific Peoples.

**Figure 26** shows that for total COVID-19 attributed mortality rates by deprivation, the most deprived areas had the highest rate (15.0 per 100,000), followed by mid-range deprivation areas (9.6 per 100,000) and the lowest rate was in the least deprived areas (5.9 per 100,000).

**Figure 27** shows that mortality rate for people with more than 2 doses (9.2 per 100,000) was significantly lower compared to people with 2 or less doses. The mortality rate for those with more than 2 doses was 2.6 times lower than those with 2 doses and 2.2 times lower than those with less than 2 doses. Confidence intervals overlapped between the "less than 2 doses" and the "2 doses" groups which suggests that the difference in mortality rates between those two groups is not significant.

***Figure 25: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by ethnicity, March 2020 to 31 July 2022***




Source: EpiSurv, Death Documents, The Healthcare User database, Mortality Collections database and CVIP population estimates, March 2020 to 31 July 2022

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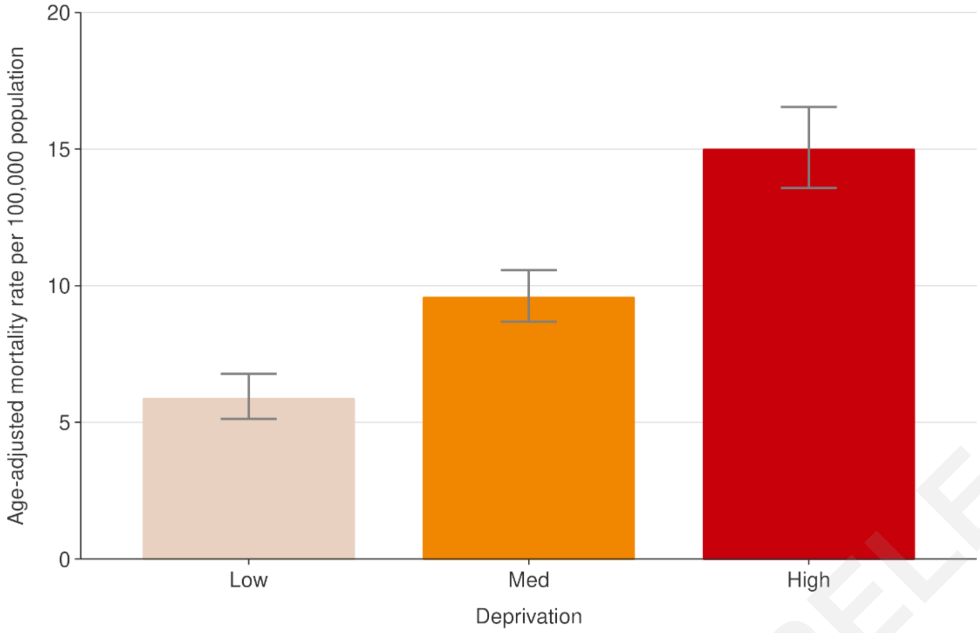
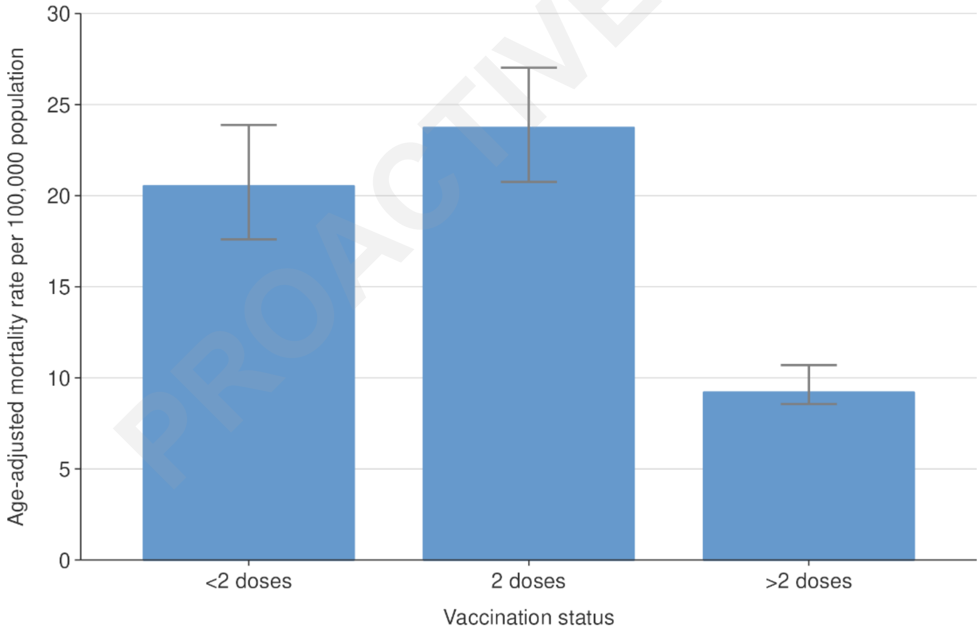
***Figure 26: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by deprivation, March 2020 to 31 July 2022***




Source: EpiSurv, Death Documents, The Healthcare User database, Mortality Collections database and CVIP population estimates, March 2020 to 31 July 2022

***Figure 27: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by vaccination, March 2020 to 31 July 2022***




Source: EpiSurv, Death Documents, The Healthcare User database, Mortality Collections database and CVIP population estimates, March 2020 to 31 July 2022

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**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.

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# Border Surveillance

**Cases detected at the Air Border**

Imported cases initially increased as travel volumes increased following the first stage of border reopening in March. Detected cases then remained fairly constant through May and early to mid-June before rising again in late June. Detected cases have decreased in the past week to around 200-300 per day after remaining steady in the past month.

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. In the last month, 4% to 5% of recent arrivals are reporting a positive test.

**Figure 28** 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, United Arab Emirates, the Cook Islands and Fiji (**Figure 29**).

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.

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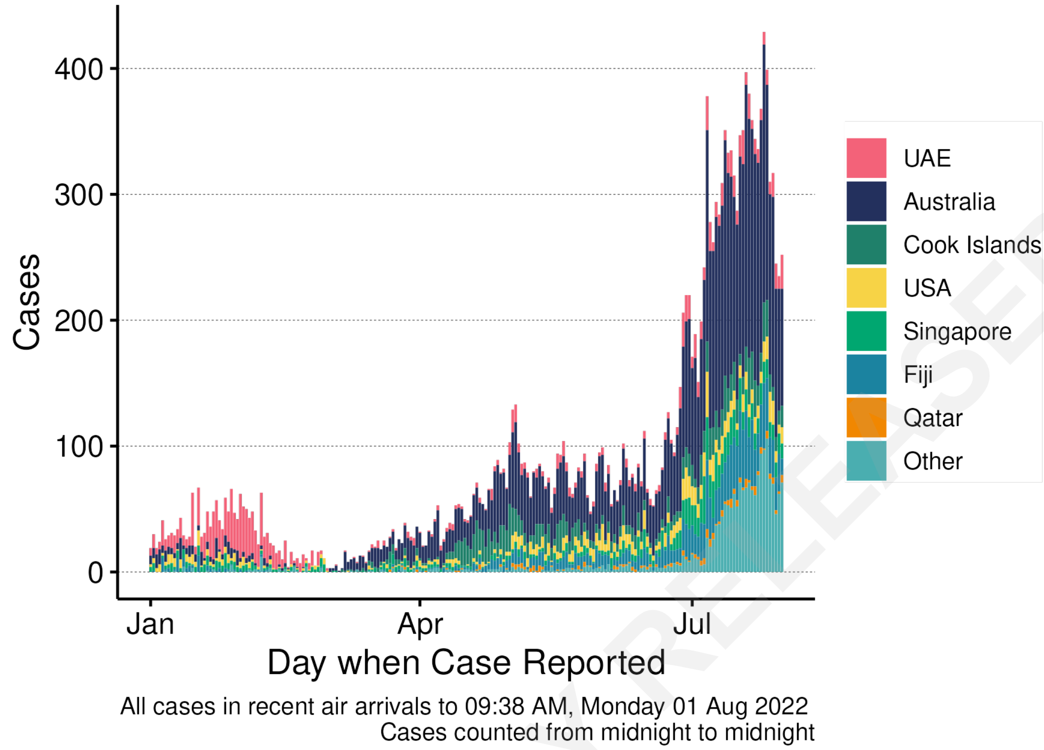
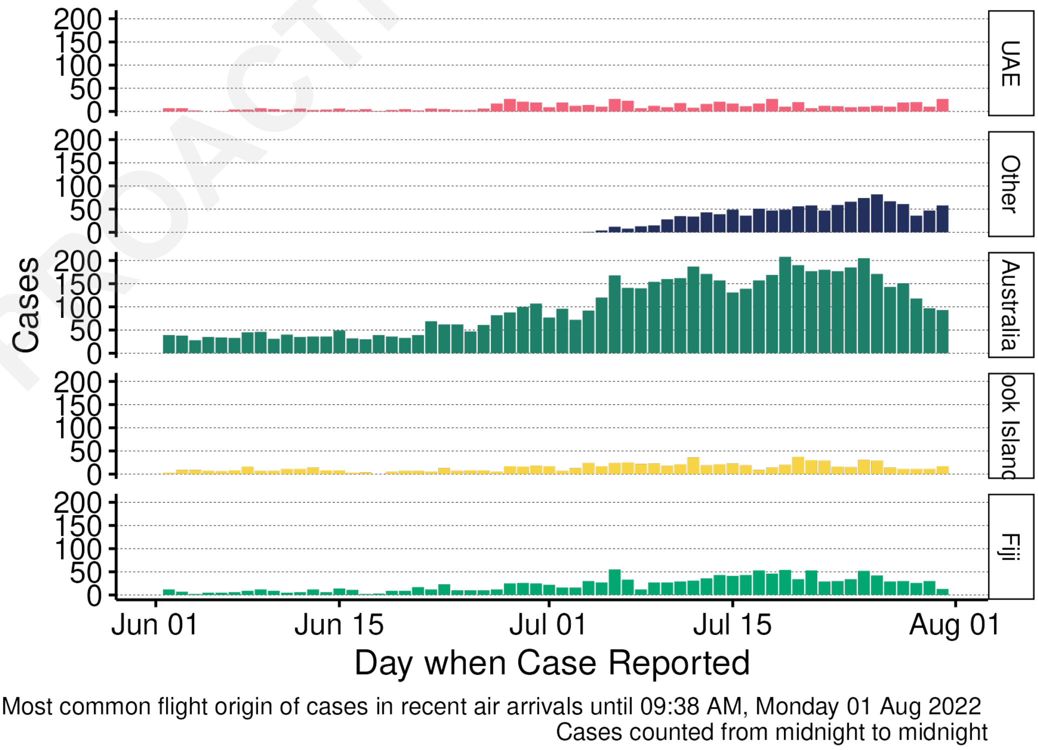
***Figure 28: Cases reported in post-arrival testing by country of flight departure, 01 January – 31 July 2022***




Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

***Figure 29: Cases reported in post-arrival testing, by the five flight-departure countries with most cases reported in the seven days to 31 July 2022***




Source: NCTS/EpiSurv as at 2359hrs 31 July 2022

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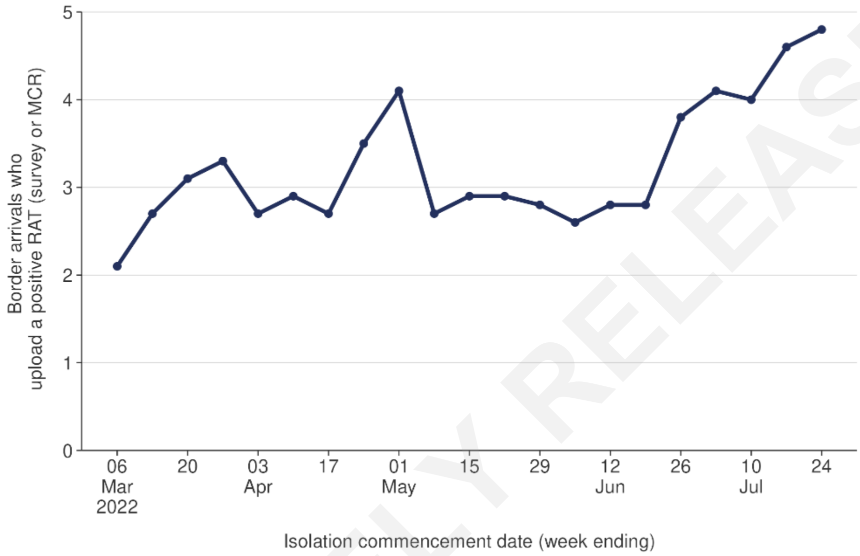
### Testing of Border Arrivals

**Figure 30** shows that the percentage of positive RATs in border arrivals who reported a test was mostly between 2 – 4.8% for the period 6 March – 24 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 4.8% (3,322 of 69,902 arrivals) for the week ending 24 July.

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

***Figure 30: Percentage of positive tests in border arrivals who report RATs, 6 March – 24 July 2022***




Sources: NCTS/EpiSurv/Éclair as at 2359hrs 24 July 2022

### Whole Genomic Sequencing of Imported cases

**Figure 31** shows the completion metrics for border returnee testing and WGS from 06 March to 24 July 2022. The percentage of arrivals uploading a RAT has been constant with an average of approximately 90%. In the week ending 24 July, there were 69,902 border arrivals, of whom 88% (61,357) 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.

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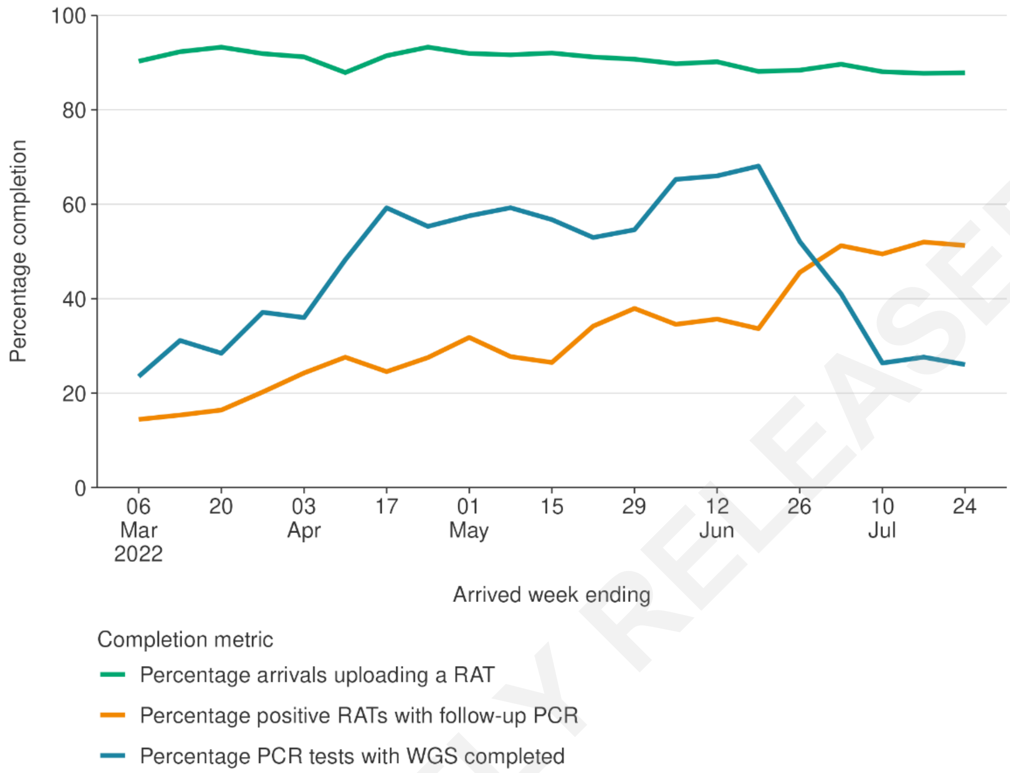
***Figure 31: Completion metrics for border returnee testing and WGS for arrivals, 06 March – 24 July 2022***

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Sources: NCTS/EpiSurv/Éclair as at 2359hrs 03 July 2022, ESR WGS 24 July 2022[7]

**Figure 32** shows the border returnee testing and WGS metrics for arrivals. In the week ending 24 July, 51.0% of border arrivals who returned a positive RAT had a follow-up PCR test. This is similar to 50.4% the week prior and is the highest we have seen in months.

In the week ending 24 July, the percentage of PCR positive border arrivals with WGS complete was 26%. 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%.

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 01 August, ESR had received samples from 643 of the 4,870 PCR-positive border cases with a report date in the two weeks to 29 July. Of the successfully sequenced samples, 79% were BA.5, 10% were BA.2, 10% were BA.4 and <2% were BA.2.75.

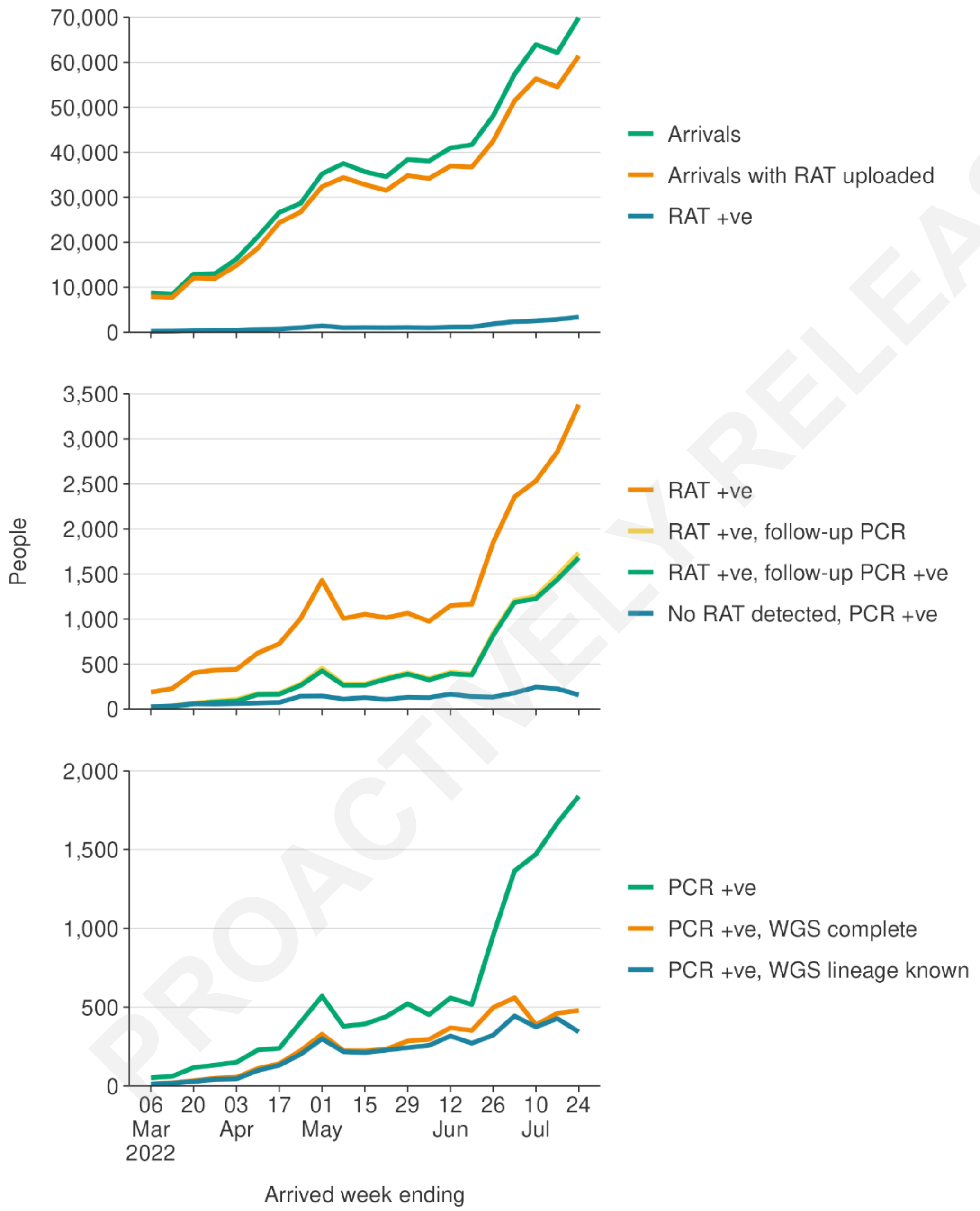
A case can only be referred to ESR for WGS if the traveller is referred for PCR testing and the lab sends the PCR sample for sequencing.

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.

[7] 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 32: Border returnee testing and WGS metrics for arrivals, 06 March – 24 July 2022***




PROACTIVELY RELEASED

Sources: NCTS/EpiSurv/Éclair as at 2359hrs 19 June 2022, ESR WGS 24 July 2022[8]

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

# 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 31 July 2022, the number of weekly cases decreased by 9% to the previous week, with 6.5 million new cases reported.
- The number of new weekly deaths remained stable this week as compared to the previous week, with over 14,000 fatalities reported.
- At the regional level, the number of reported new weekly cases increased in the Western Pacific Region (+20%) and the African Region (+5%); at the same time, it decreased or remained stable in the European Region (-35%), the Eastern Mediterranean Region (-12%), the South-East Asia Region (-2%) and the Region of the Americas (-2%).
- The number of new weekly deaths increased in the Western Pacific Region (+44%), the Eastern Mediterranean Region (+26%), the South-East Asia Region (+20%), and the African Region (+12%), while it decreased in the European Region (-26%). The number of new weekly deaths in the Region of the Americas was similar to the figure reported during the previous week.
- Globally, from 1 July to 1 August 2022, 204,668 sequences were collected and uploaded to GISAID. The Omicron VOC remains the dominant variant circulating accounting for 99% (203,440) of sequences.
- A comparison of sequences submitted to GISAID in the week ending 23 July and the week ending 16 July shows that BA.5 and BA.4 Omicron descendent lineages continued to be dominant globally, with a weekly prevalence that increased from 63.8% to 69.6%, and from 10.9% to 11.8%, respectively. Conversely, within the same time period, BA.2.12.1 and BA.2 sequences showed a decline from 4.4% to 1.9% and from 2% to 1.5%, respectively.
- 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

- In the 14 days up to 02 August 2022, there were 2,517 new cases per 100,000 population. This is a slight increase from the week prior (14 days up to 26 July 2022) where there were 2,491 per 100,000 population.
- New South Wales (NSW) and Queensland (Qld) both had slight increases in rates of new cases while all other states and territories decreased compared to last week.
- New cases per 100,000 for regional and remote areas has remained stable while those for Aboriginal and Torres Straight Islander people have increased from 410 per 100,000 to 623 per 100,000. This increase occurred in Northern territory (+54%), Queensland (+30%) and Victoria (+16%).

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- As at 3 August 2022, there are 4,861 current cases in hospital with 162 in ICU. This is a decrease from when last reported (26 July 2022) where there were 5,571 hospitalised cases. The majority of these cases are in New South Wales (2,288), Queensland (788) and Victoria (743) which is a continuation of the distribution observed when last reported. However, all three areas have had reductions in hospitalised cases with Queensland considerably decreasing (-30%). These decreases follow the record levels of hospitalisation observed last week, potentially indicating the country is past a peak in healthcare strain.
- The Australian government has accepted Australian Techincal Advisory Group on Immunisation (Atagi) advice and approved the Moderna vaccine for children aged 6 months to 5 years with serious health conditions. New groups eligible include children with congenital cardiac disease, chronic lung disease, type 1 diabetes, severe cerebral palsy, Down's syndrome, and chronic neurological or muscular conditions. Atagi is monitoring overseas evidence on the benefits of extending vaccines broadly to all children under five – currently their advice is that such young children with no health conditions are at low risk of severe COVID-19 illness.
- The Therapeutic Goods Administration announced it has begun evaluating applications for Pfizer to extend the use of its vaccine to children as young as six months old. The vaccine is currently available for children 5 and over.

United Kingdom

- For the week ending 20 July 2022, the percentage of people testing positive for coronavirus (COVID-19) decreased in England, Wales, and Scotland; the trend was uncertain in Northern Ireland.
- In England, the estimated number of people testing positive for COVID-19 was 2,632,200 (95% credible interval: 2,507,500 to 2,757,500), equating to 4.83% of the population, or around 1 in 20 people.
- In Wales, the estimated number of people testing positive for COVID-19 was 156,200 (95% credible interval: 125,100 to 190,400), equating to 5.14% of the population, or around 1 in 19 people.
- In Northern Ireland, the estimated number of people testing positive for COVID-19 was 113,400 (95% credible interval: 86,600 to 143,900), equating to 6.18% of the population, or around 1 in 16 people.
- In Scotland, the estimated number of people testing positive for COVID-19 was 272,000 (95% credible interval: 223,600 to 324,400), equating to 5.17% of the population, or around 1 in 19 people.
- The overall hospital admission rate of COVID-19-confirmed patients in England decreased to 16.29 per 100,000 people, while the intensive care unit (ICU) and high dependency unit (HDU) admission rate decreased slightly to 0.51 per 100,000 people in the week ending 24 July 2022. Hospital admission rates decreased across most age groups and regions.
- The number of deaths involving COVID-19 in the UK increased from 696 to 864 in the latest week (ending 22 July 2022). Deaths involving COVID-19 accounted for 6.9% of all deaths in the latest week; this is an increase from 5.8% in the previous week. The number of deaths involving COVID-19 in England increased in groups aged 25 years and over and remained similar in groups aged under 25 years (in the week ending 22 July 2022).

Japan

- For the week ending July 24 2022, Japan continued to have the highest new COVID-19 case numbers globally according to WHO.

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- Cases in Japan continue to increase with cumulative COVID-19 cases 13.1 million. At 2 August 2022, daily new confirmed cases were at 204,900 and appear to be increasing each day.
- The recent surge is driven by children and people under 20, who comprised almost a third of new infections in July, with those under 30 accounting for about half of all new cases.
- Daily deaths are at 0.9 per million people as a 7-day rolling average, increased from 0.64 per million people recorded the previous week.
- Japan's focus is on supporting regional authorities to manage their local situations rather than imposing a national response. The city of Osaka has advised elderly people to avoid non-essential outings and Tokyo is encouraging frequent testing of residents and mask-wearing, including offering free testing centres at train stations.
- The occupancy rate of beds set aside for COVID-19 patients in Tokyo has risen to more than 50%.

**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 behavioural study from New Zealand looking at the impact of Compliance with Covid-19 measures found that it is important to look at the strength of individuals' motivation and their beliefs about the advantages and disadvantages of policy outcomes and policy measures. They found this differentiation was useful in predicting an individual's possible behavioural responses to a measure.
- 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.

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- 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 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

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**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%) |

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# Health System Capacity

**Health Sector Dashboard**

*Aged Residential Care*[9]*:* As at 03 August, 519 cases were reported in ARC facilities. This has reduced from 649 at 25 July.

*Daily hospital occupancy*[10]: As at 03 August, the national daily hospital occupancy metrics show overall ICU/HDU (critical care) occupancy at 68.2%, with 14.4% of ventilators in use, and 90.2% of ward beds occupied.

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[9] Oral updates from PHUs indicate that this is a large undercount due to challenges in uploading positive RAT results. Work is being done to enable uploading, which will result in a more complete picture of the data.

[10] Occupancy figures are reported to the Ministry of Health at 0830hrs Monday to Friday for the previous day as at 2359hrs.

## Care in the Community

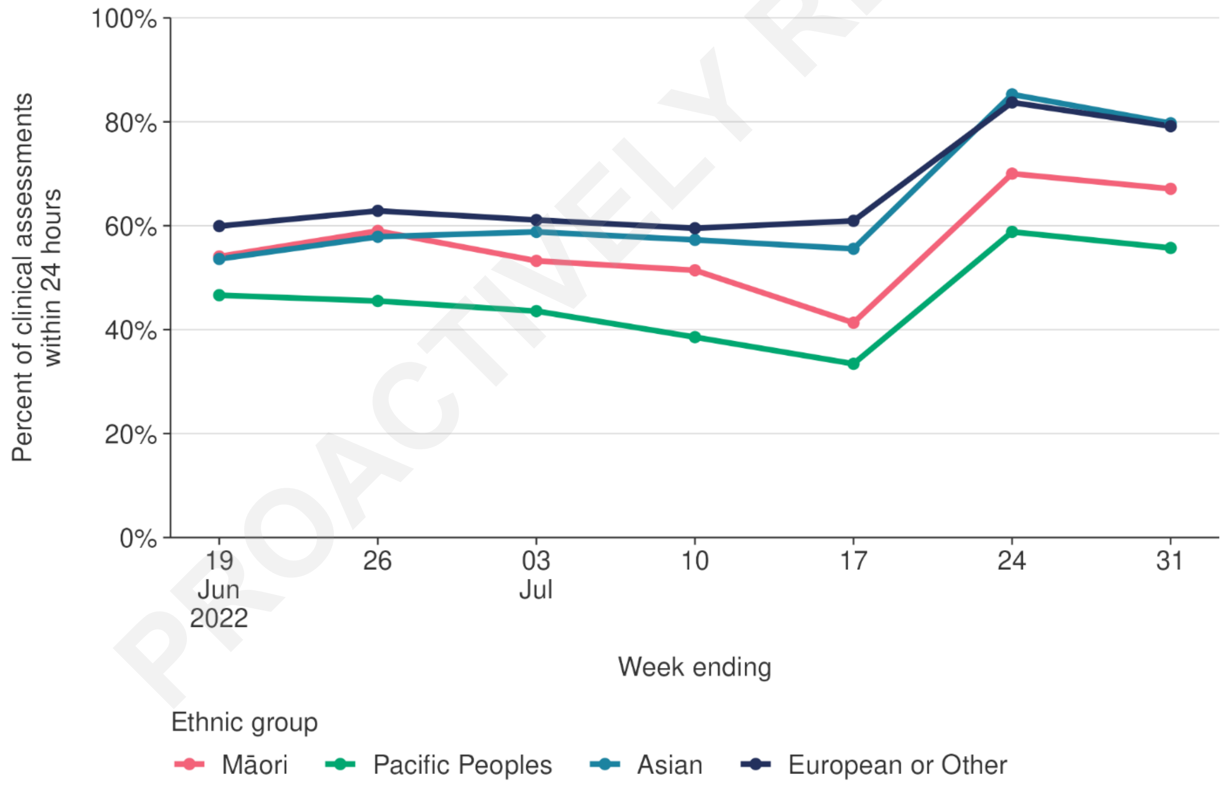
*Health System Indicators*

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 33** shows the percentage of clinical assessment completed within 24 hours by ethnicity. In the week ending 31 July, 67% of Māori, 56% of Pacific Peoples, 80% of Asians and 79% 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 34** 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 1,319.

***Figure 33: Percent of initial clinical assessment completed within 24 hours of positive case by ethnicity, 19 June – 31 July 2022***




Sources: CCCM/QLIK, Socrates 31 July 2022

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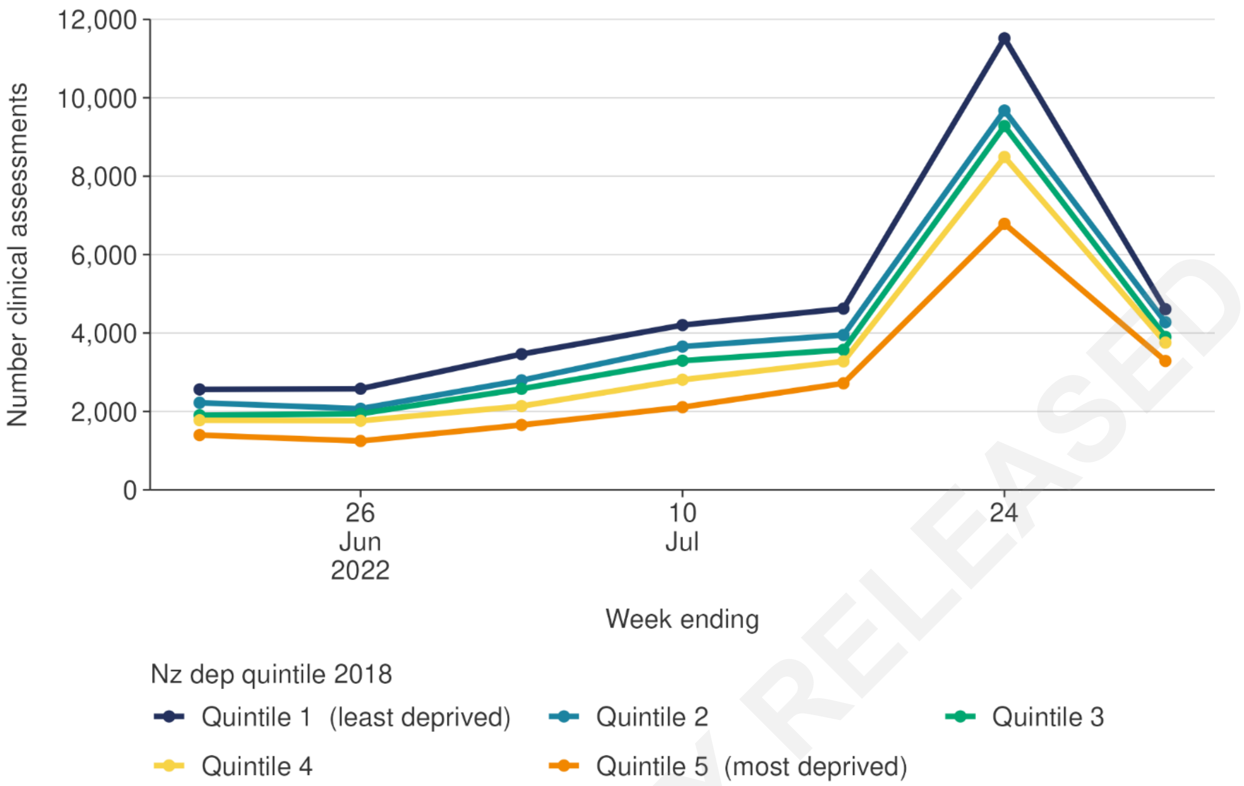
***Figure 34: Number of clinical assessments by deprivation 26 June – 24 July 2022***

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# Glossary

<u>Data Sources</u>

*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.

*<u>Data limitations</u>*

*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.

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*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.

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- 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.

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