COVID-19

Trends and Insights Report

Updated 08 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 are incomplete.

Key insights

Infection Trends

- **Nationally, the weekly case rate was 9.9 per 1,000** population for the week ending 3 July. This is an increase from the previous week, which was 7.2 per 1,000.
- **For the week ending 03 July**, estimates suggest that **2.1% (683/31,796) of healthcare workers** and **1.4% (299/20,917) of border workers tested positive.** While these are not representative samples of New Zealanders, **border workers' risk is very similar to the general community risk** (but more reflective of the Auckland population).
- **Border worker comparisons with Auckland** case rates suggest **under ascertainment of cases (1.4% [14 per 1,000] versus 9.9 per 1,000**, respectively).
- **Levels of viral RNA in wastewater have increased in all regions.**
- Both case rates and wastewater viral RNA levels have increased for all regions in the past week, **strongly suggesting an increase in new infections nationwide.**
- In the past week, **all 18 Districts experienced an increase in case rates.**

Demographic Trends in Case Rates

- The **lowest case rates** continue to be in **Pacific Peoples (4.6 per 1,000);** case rates in this group have increased by **50% in the past week. Māori case rates have also increased** and are now at **5.7 per 1,000.**
- **For the 65+ age group,** case rates in the Northern region increased by 58.7% , Te Manawa Taki increased by 53.3%, Central increased by 55.4% and Southern increased by 51.0% in the past week.
- Case rates for those at higher risk of complications or severe illness from COVID-19, those aged 45-64 and those aged 65+, were highest in European or Other (45-64 at 12.9 per 1,000 and 65+ at 11.6 per 1,000).

Whole Genomic Sequencing

- Among Omicron cases, BA.1 was the dominant subvariant (~60%) at the start of February 2022, but has since been outcompeted by **BA.2, which made up about 57% of sequenced community cases** in the past week.

- This week, **all three watchlist variants (BA.2.12.1, BA.4 and BA.5) were again detected** in community samples with increasing frequency. Wastewater data also continues to detect BA.4/5 and BA.2.12.1 at a number of sites. The upward rise of the BA.5 variant of Omicron is a key observation – it now makes up approximately one third of community cases.
- ESR estimates that **BA.5 will likely become the dominant variant next week, and that BA.5 is largely responsible for the current national increase in case rates.**
- As of 03 July, ESR received samples from and had processed 69 of the 421 PCR positive hospital cases with a report date in the two weeks to 01 July 2022. Of these, 74% had a BA.2 genome, 9% were BA.2.12.1, and 17% were BA.5.

Border Surveillance

- In the week ending 26 June, there were 48,072 border arrivals, of whom **88.2% (42,413) uploaded a RAT result upon arrival.** This is similar to 88.1% in the week prior.
- In the week ending 28 June, **3.5% of recent arrivals tested positive** via RAT, up from 2% in recent weeks.
- **Cases in border arrivals rose sharply after 20 June, and are approaching a new steady state.** By 4 July, they were **between 150 and 200 reports per day**. While the increase is sudden, it is in line with expectations for the removal of pre-departure testing from 20 June, and is still few compared to cases acquired in the community.
- In the week ending 26 June, the percentage of PCR positive border arrivals with WGS complete was 27.6%. The figure will rise as more of the recent cases are processed: It is now 64.8% for the week ending 19 June and 72.2% for the week ending 12 June.
- The number of samples available for genomic sequencing has increased sharply in the last week, and **now well exceeds the target of 300 per week** needed for good detection of new variants.

Hospitalisation and Mortality

- For the week ending 03 July, the national hospital occupancy rate was 8.2 per 100,000 population, **an increase of 19% from the week prior**. Hospital occupancy rates increased across all regions in the past week. The Northern region (9.4 per 100,000) increased by 24%, Te Manawa Taki (7.5 per 100,000) increased by 34%, Central region (7.9 per 100,000) increased by 5% in the past week, and Southern (7.0 per 100,000) increased by 11%.
- As of 03 July 2022, there were 1,512 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, **50% 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.

International and Scientific Insights

- Globally, the number of **new weekly cases increased for the fourth consecutive week** after a declining trend since the last peak in March 2022. During the week of 27 June to 3 July 2022, over 4.6 million cases were reported, a figure similar to that of the previous week. **The number of new weekly deaths declined by 12%** as compared to the previous week, with over 8,100 fatalities reported.

- Globally, the proportions of Omicron lineages BA.2 and BA.2.12.1 have decreased. From 19-25 June, the prevalence of BA.2 among all sequences submitted to GISAID was 9% (a decrease from 16% in the previous week) and the prevalence of BA.2.12.1 was 11% (a decrease from 19% in the previous week). BA.2 and BA.2.12.1 have been reported in 150 and 84 countries, respectively. There is no evidence yet regarding any change in severity with BA.4, BA.5 or BA.2.12.1 as compared to BA.2.
- However, the rise in prevalence of BA.2.12.1, BA.4 and BA.5 has coincided with an increase in cases in several WHO regions. In some countries, the rise in cases also resulted in a surge in hospitalisations, ICU admissions and deaths. In countries where the incidence of BA.4, BA.5 or BA.2.12.1 cases is now declining, the rise in cases, hospitalisations, ICU admissions and deaths have been lower as compared to the previous BA.1 and/or BA.2 waves.
- The scientific insights section includes studies on outbreak management, economic evaluations, transmission dynamics and modelling studies.

Health System Capacity

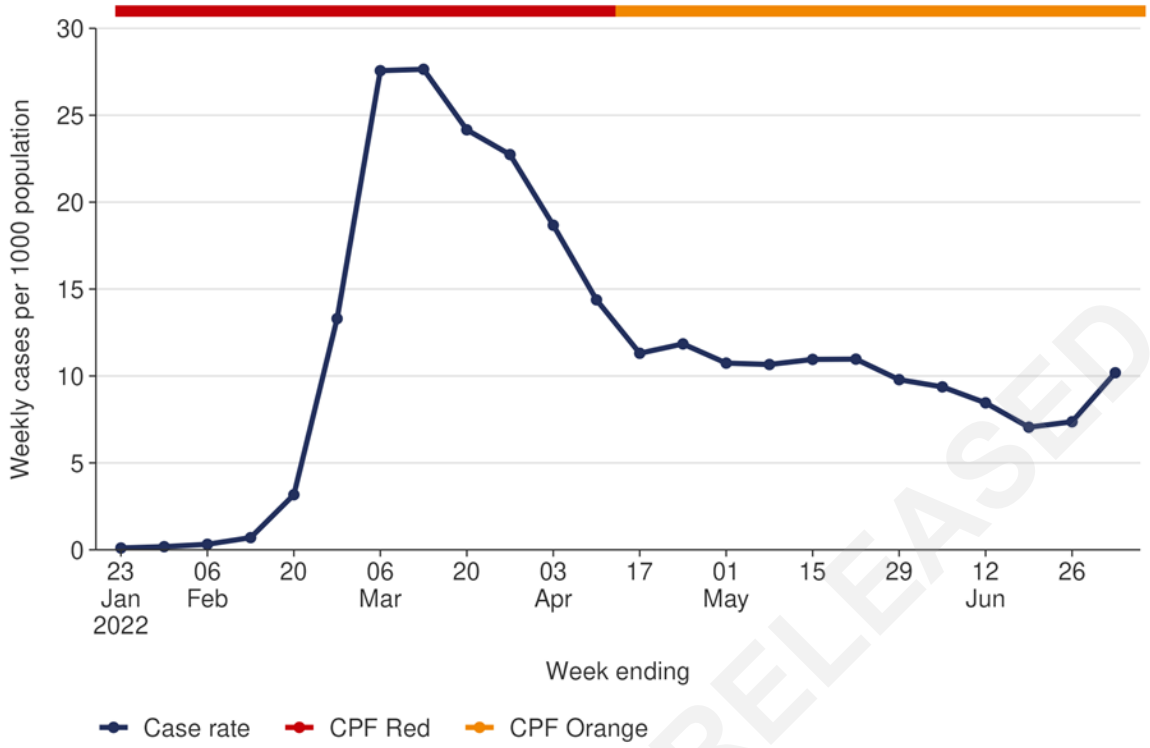
- For the week ending 30 June, **21% of the 656 Aged Residential Care (ARC) facilities had at least one active COVID-19 case** (138 of 656 facilities).
- Nationally, emergency department attendance volumes for the week ended 26 June decreased 3.2% to 22,761. This is the lowest it has been since mid-May.
- National SSED (Short Stays in Emergency Departments) for all patients seen and treated in **6 hours in ED was 74% week ending 26 June** (compared with 74% week ending 19 June).
- **Hospitals continue to experience high occupancy**, however there has been a reduction in the amount of time spent over 90% hospital occupancy across most of the major hospitals this week. That is, acute patients with a length of stay 7 days or over continue to remain elevated across the motu, despite a slight reduction this week.
- **The percentage of FluTracking participants who reported fever and cough has steadily increased since mid-February, exceeding percentages observed in previous years for this time of year.** Activity remains high for this time of year; while this may be in part driven by the current COVID-19 Omicron outbreak, there is also evidence of increasing non-COVID-19 ILI activity throughout New Zealand.

Domestic epidemic outlook

Infection outlook

- NZ was in COVID Protection Framework Red from the start of the year until 14 April 2022 when it switched to Orange, where it continues to be **(Figure** 1**). Since the March peak, case rates were declining** leading up to the week of 17 April, after which cases overall have continued to decline at a much slower rate than previously.
- **However, in the past week, there has been a substantial increase in cases; that is, across all regions, the increase is the highest that has been observed since the end of the first wave**. There has been a 43% increase in cases rates in the week ending 03 July compared to week ending 19 June.
- There have also been steep increases in wastewater RNA levels across the motu, **especially for Southern where levels are higher than they were in March.**
- Cases in those who are **65 years and older have increased substantially** by 67% in the past two weeks.
- WGS of BA.5 indicates that it now makes up 30% of community samples. The impact of the increase in BA.5 and BA.4 in terms of increasing cases has been partially cross-validated by EpiNow modelling which suggests that there **has been an unexpected increase in transmissions in the previous week.**
- Due to the overlapping impacts of immune evasion characteristics of BA.5 and BA.5, changes in adherence to public health measures, and infections moving into previously protected communities at high risk of infections, will result in substantial **increases in infections in the coming weeks**.

Figure 1: National weekly case rates and CPF level for 02 Jan – 03 July 2022



Source: Éclair/Episurv, 2359hrs 03 July 2022

Tertiary Care outlook

- **Inpatient test positivity for COVID-19 has been steadily increasing for the past month** and is now 35 per 1,000 inpatients.
- New CMA modelling scenarios predict a sharp rise in hospitalisations from BA.5 becoming the dominant variant in the community.
- There continues to be substantial risk for the at-risk and elderly as infection has not reduced in older age groups.
- It is likely the highest case hospitalisation and mortality risk will be for at-risk populations such as those who are older, unvaccinated and/or have co-morbidities.

Contents

Figures

Infection Trends

Summary of evidence for infection and case ascertainment trends

Currently, **the national border workforce case rates in the past week (14.3 per 1,000) were higher than the general population (9.9 per 1,000);** these rates were similar when comparing border workforce rates in the Northern region among 25-44 year-olds at 12.8 per 1,000 (where the greatest proportion of the workforce is concentrated). This continues to suggest the **underlying level of infection could be higher than diagnosed rates**. Consistent with the trend in both border and health care workers, **general population case rates have increased in all regions.** This increase is consistent at a national level across all ethnicities and age groups.

Inpatient test positivity at tertiary hospitals across the motu has increased steadily in the past two weeks with approximately 3.5% (35 per 1000) of inpatients testing positive for COVID-19. This also suggests confirms the increases seen in the general population.

Levels of viral RNA in **wastewater have increased in all regions in the past week.** Wastewater RNA levels in Southern are higher than compared to during March. In line with community case trends, increase in levels confirm a substantial increase of new infections in the past week.

The **effective R is 1.3** for cases to 02 July, suggesting that cases are likely to increase in the coming week.

Approximation of underlying infection incidence

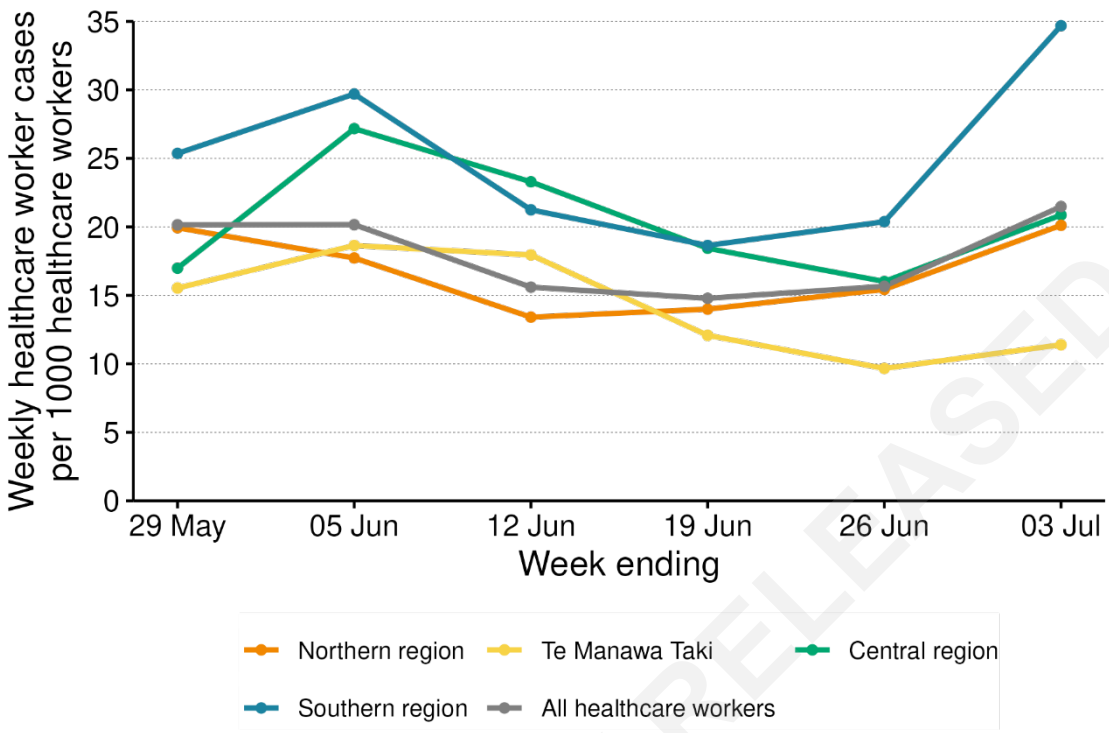
Underlying infection incidence has been estimated using case rates for routinely tested healthcare workers and border workers where there was evidence of regular testing.[1] While these workforces are not a representative sample of New Zealanders, **the border workers are now likely to have a similar risk to the general population (but more indicative of Auckland)** as their risk of infection from the community is likely to be much higher than the risk faced in their workplace.

For the week ending 03 July, estimates suggest that 2.1% (683/31,796) of healthcare workers (**Figure 2**) and 1.4% (299/20,917) of border workers[2] (**Figure 3**) have tested positive (for the first time). The rate for Northern border workers in the 25-to-44-year age group was 1.3%. Border worker comparisons with Auckland case rates suggest under ascertainment of cases (1.4% [14.3 per 1,000] versus 9.9 per 1,000, respectively).

[1] 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.

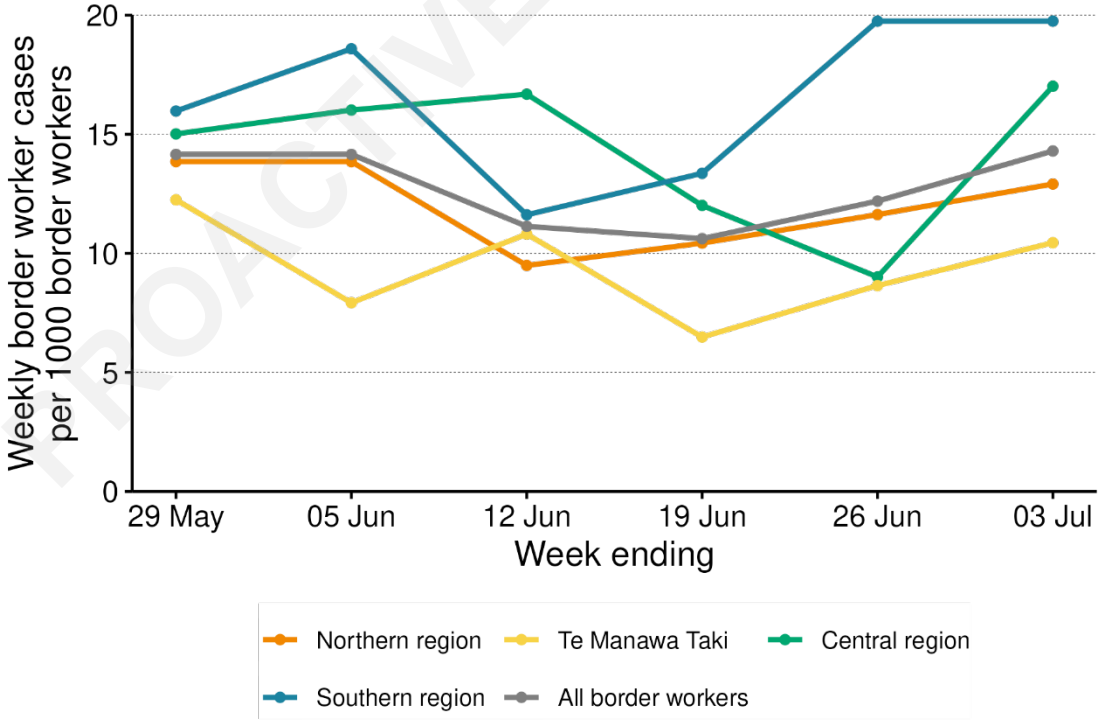
[2] This rate may be underestimated as not all border workers are rostered on and therefore not required to undertake testing.

Figure 2: Regional weekly case rates of health care workers for weeks 29 May – 03 July 2022



Source: Éclair/Episurv, 2359hrs 03 July 2022

Figure 3: Regional weekly case rates of border workers for weeks 29 May – 03 July 2022

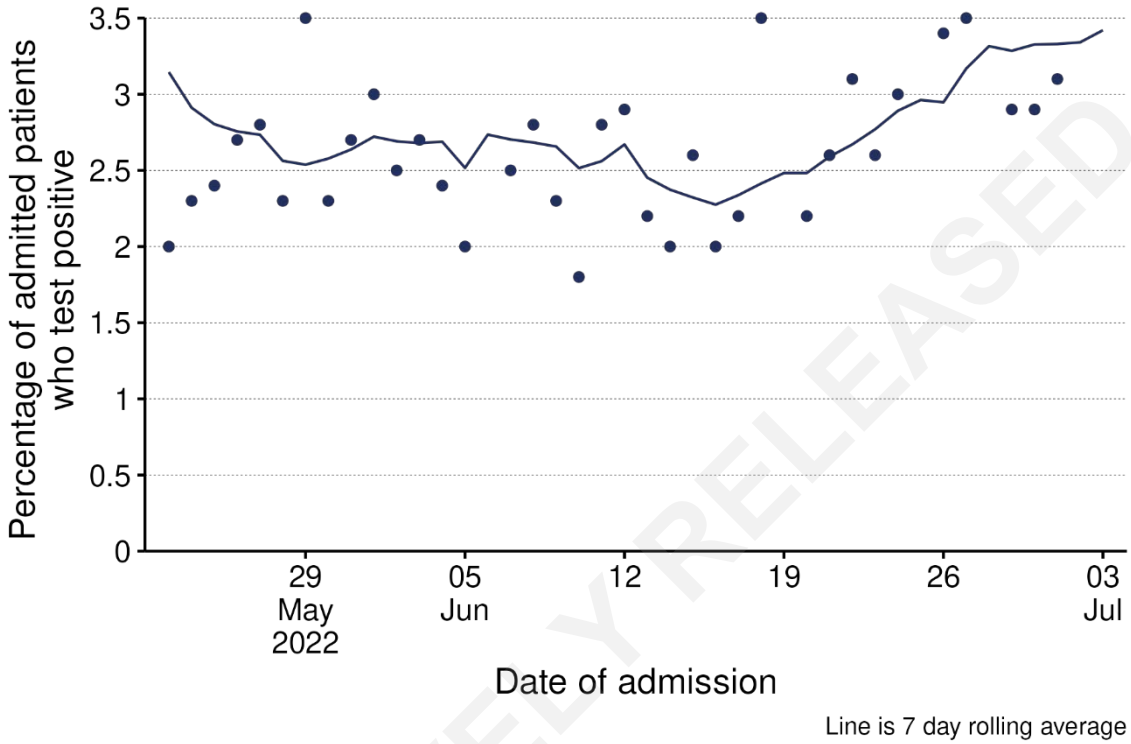


Source: Éclair/Episurv, 2359hrs 03 July 2022

Test positivity trends among tertiary hospital admissions

Inpatient test positivity trends for tertiary hospital admissions[3] is shown in **Figure 4**. **Tertiary hospital admission positivity has been steadily increasing** for the past two weeks with a 7-day rolling average of 3.5% (413/11,958) for the week ending 03 July.

Figure 4: Percent of tests positive among tertiary hospital admissions



Source: Tertiary hospitalisation data, NCTS & EpiSurv as at 2359hrs 03 July 2022

[3] 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.

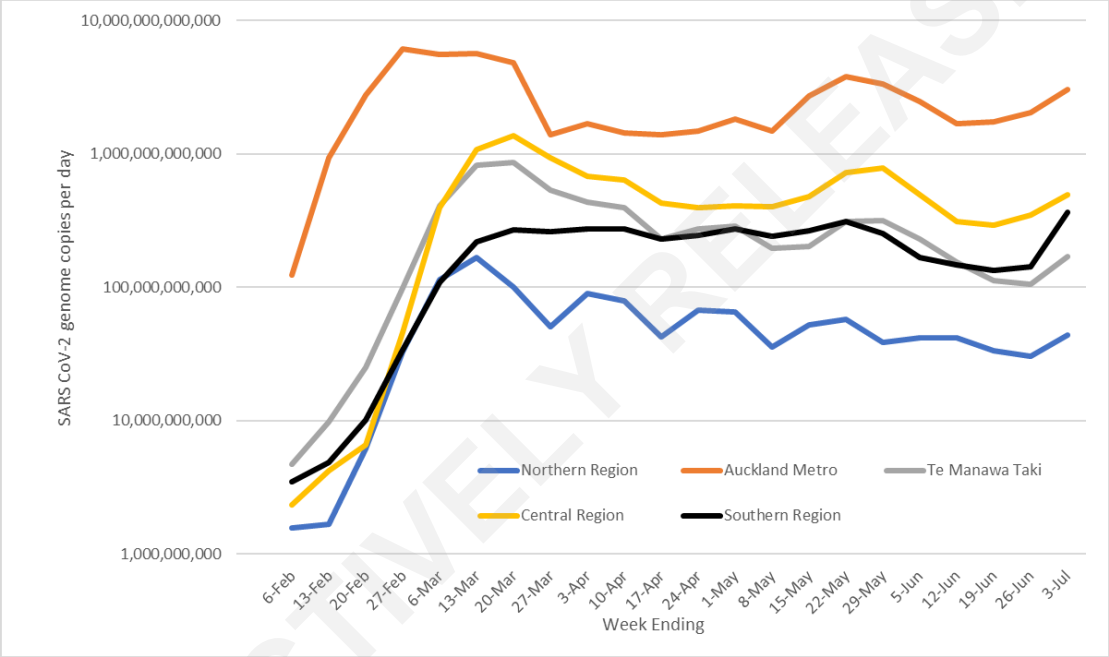
Wastewater quantification

Figure 5 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 have increased in the past week. The Southern region saw the sharpest increase, with levels higher than those observed in March.

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 5: Regional wastewater trends in SARS-CoV-2 genome quantification for weeks 06 February – 03 July 2022



Source: ESR SARS-CoV-2 in Wastewater update for week ending 03 July 2022

Trends in diagnosed cases

Overall, **the weekly case rate was 9.9 per 1,000** population for the week ending 3 July. This is **an increase from the previous week,** which was 7.2 per 1,000.

Figure 6 shows that case rates have increased across all regions in the past week. The Northern region rate (8.8 per 1,000) increased by 39.9% in the past week, Southern region (12.9 per 1,000) increased by 32.2% and Central region (11.2 per 1,000) increased by 37.0%. Te Manawa Taki (7.5 per 1,000) increased by 43.8%.

In the past week, **all 18 Districts experienced an increase in case rates**.

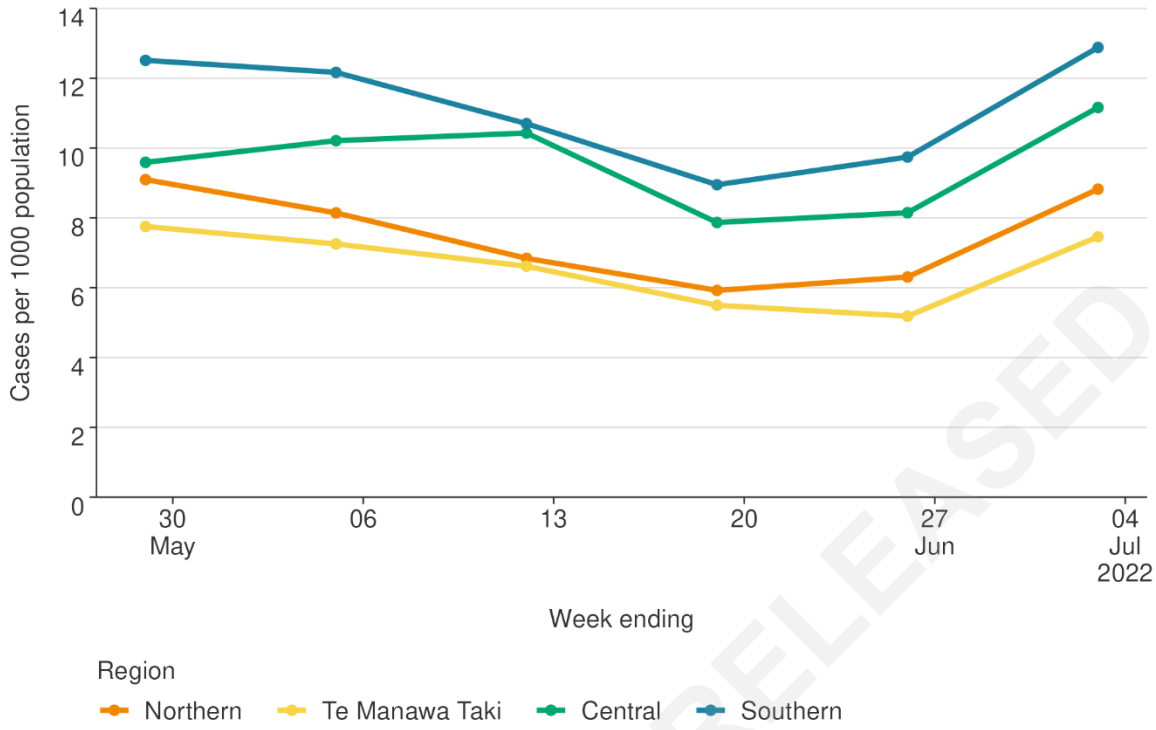
In the Northern region, the weekly case rate was highest for **Waitematā (10.6 per 1,000)** followed by Auckland District (9.9 per 1,000).

In Te Manawa Taki, weekly case rates were highest in **Taranaki (10.4 per 1,000)**, followed by Tairawhiti District (7.8 per 1,000).

The highest weekly case rates in the Central region were in **Capital and Coast/Hutt Valley District (13.2 per 1,000)** followed by Wairarapa (11.1 per 1,000 respectively). Other Districts in the Central region had weekly case rates between 7 and 11 per 1,000.

In the Southern region, the highest case rates were in **Canterbury/West Coast District (13.6 per 1,000)** followed by Southern District (13.3 per 1,000). Nelson Marlborough and South Canterbury's case rates were 10.4 and 10.3 respectively.

Figure 6: Regional weekly case rates for weeks 29 May – 03 July 2022

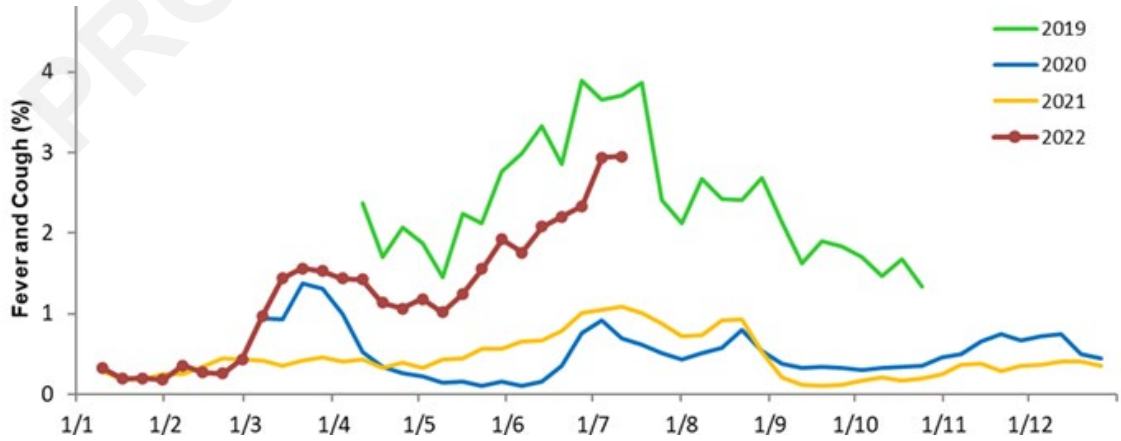


Source: NCTS/EpiSurv as at 2359hrs 03 July 2022

Trends in Influenza-like Illness symptoms

Figure 7 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 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.

Figure 7: FluTracking Influenza-like illness symptoms



Source: Weekly FluTracking Report for week ending 03 July 2022

Modelled and actual cases

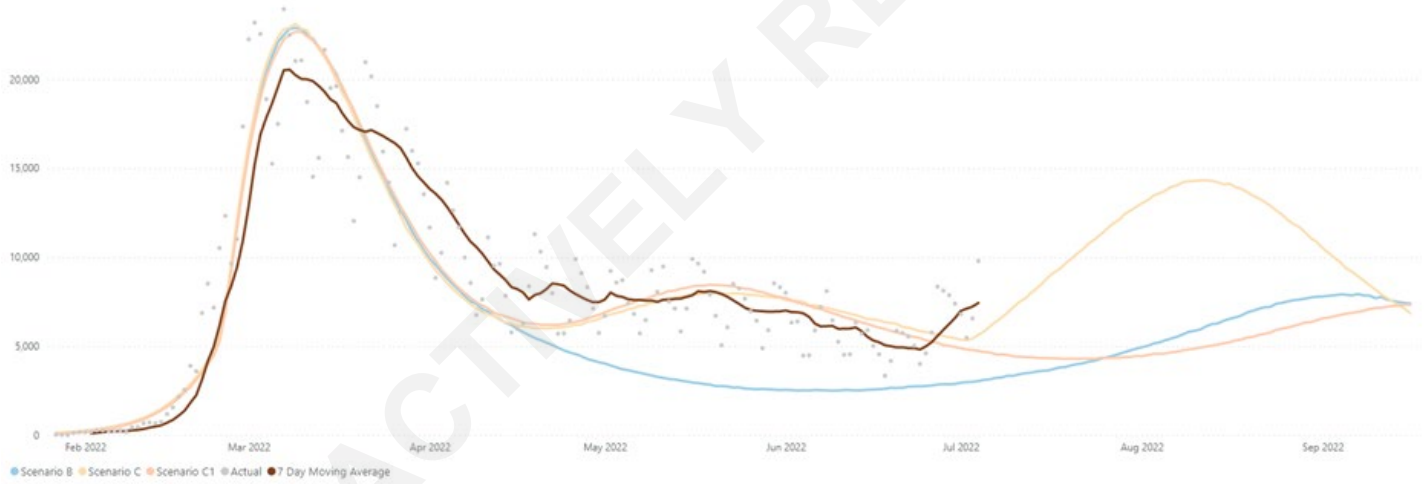
The charts below still compares actual cases to the three previous "April" scenarios for how case prevalence may develop during the rest of 2022. The three scenarios cover different possibilities for how transmission may develop as the population responds to easing of public health interventions after the March 2022 national peak (**Figure 8**). The scenarios are:

A. Small increase in mixing after the national peak in cases
B. Medium increase in mixing after the national peak in cases
C. Large increase in mixing after the national peak in cases and a shift in the distribution of cases towards older groups at the beginning of July, which has significant flow-on effects on hospitalisation and fatalities.

All three scenarios feature waning immunity after vaccination and/or infection, which leads to a "winter wave" beginning as early as July (Scenario C).

These scenarios are based on the current Omicron BA.2 variant. Currently, cases are tracking closely to 'C', the scenario with the largest increase in transmission after the March peak.

Figure 8: COVID Modelling Aotearoa scenarios compared with reported cases nationally (BA.2 scenarios)



Sources: COVID-19 Modelling Aotearoa Branching Process Model April 2022, and Ministry of Health reported case data 04 July 2022

Effective reproduction rate, and forecasts of cases and infections

These estimates used the *EpiNow* package[2] on 05 July using data to 02 July.[4] The median estimate of **effective R (R_{eff}) nationally is 1.3** (90% Credible Interval [CI]: 1.0-1.5) for cases to 02 July. This value is the highest median estimate reported in the past few months. After adjusting for data lags; this is **above the previous week's estimate of 1.0** (CI: 0.9-1.2) for cases to 25 June. The confidence interval indicates a relatively low level of uncertainty for this estimate, compared to last week's narrower confidence interval.

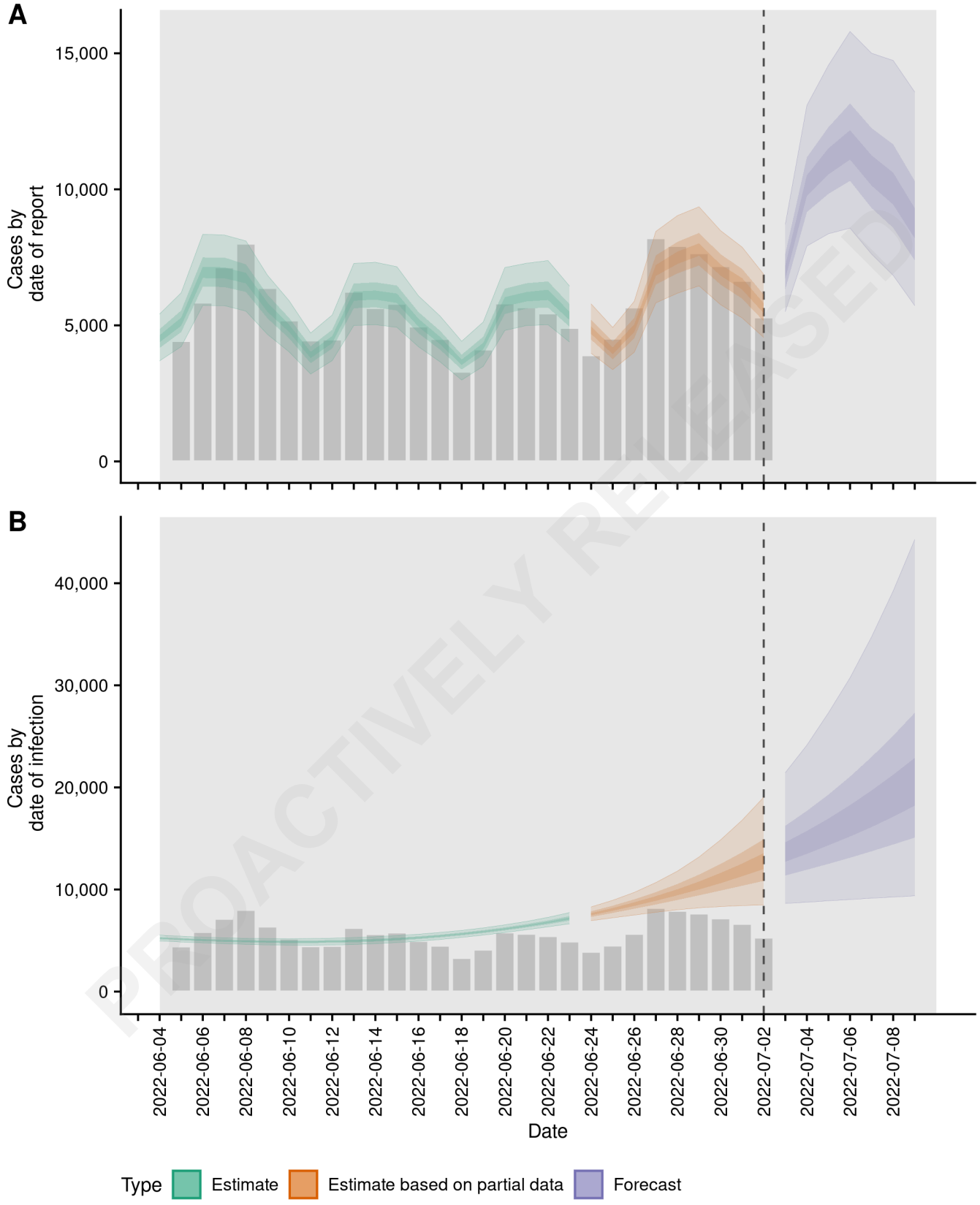
Figure 9 compares the previous week's model median estimate for 02 July 2022 of 3,607 cases per day, with a 50% credible interval of 3,199 – 4,108, to the actual reported cases of 6,460. This was a large underestimate, with the actual number being well outside of the 50% credible interval, **suggesting that there has been an unexpected increase in transmission**.

For all Public Health Units (PHUs), the model is estimating a **median R_{eff} between 1.1 – 1.4.**

The model's median estimate is that national reported cases could be 8,713 cases per day by 09 July (50% credible interval: 7,388 – 10,303). However, the credible intervals for the projected cases would be even wider if the possibility of continuing trend changes in effective R were included.

[4] 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, R_{eff}. 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 9: Projected national cases by (A) date of report and (B) date of infection



Source: EpiNow 02 July 2022, based on NCTS and EpiSurv cases

Demographic trends in case rates

Ethnicity trends over time and by region

Figure 10 shows national case rates by ethnicity. **Figure 12** shows regional case rates by ethnicity.

In the past week, **case rates increased steadily for all ethnicities.** 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 11.4 per 1,000** (up from last week's 8.4 per 1,000), followed by Asian at 10.5 per 1,000 (up from 7.4 per 1,000 last week). The **lowest case rate continues to be in Pacific Peoples (4.6 per 1,000),** which is a 50% increase from last week (3.1 per 1,000). The Māori case rate has also increased moderately by 36%, from 4.2 per 1,000 in the previous week to 5.7 per 1,000.

Case rates in the Northern region for European or Other were 10.4 per 1,000 and rates for Asian were 10.0 per 1,000. Māori had the second lowest case rate at 5.3 per 1,000. Pacific Peoples (4.1 per 1,000) had the lowest case rates in this region.

Case rates for Te Manawa Taki were highest for European or Other (9.5 per 1,000), followed by Asian (7.3 per 1,000). Māori had the second lowest case rate at 4.3 per 1,000 followed closely by Pacific Peoples who had the lowest case rates at 4.2 per 1,000.

Case rates in the Central region were highest for European or Other (12.7 per 1,000), comparable to Asian (12.2 per 1,000). Māori had the second lowest case rate at 6.4 per 1,000 and Pacific Peoples had the lowest case rate at 5.6 per 1,000.

In the Southern region, case rates were highest for Asian (14.4 per 1,000) and European or Other (13.3 per 1,000). Māori had the second lowest case rate at 9.1 per 1,000 and Pacific Peoples had the lowest case rates at 7.4 per 1,000.

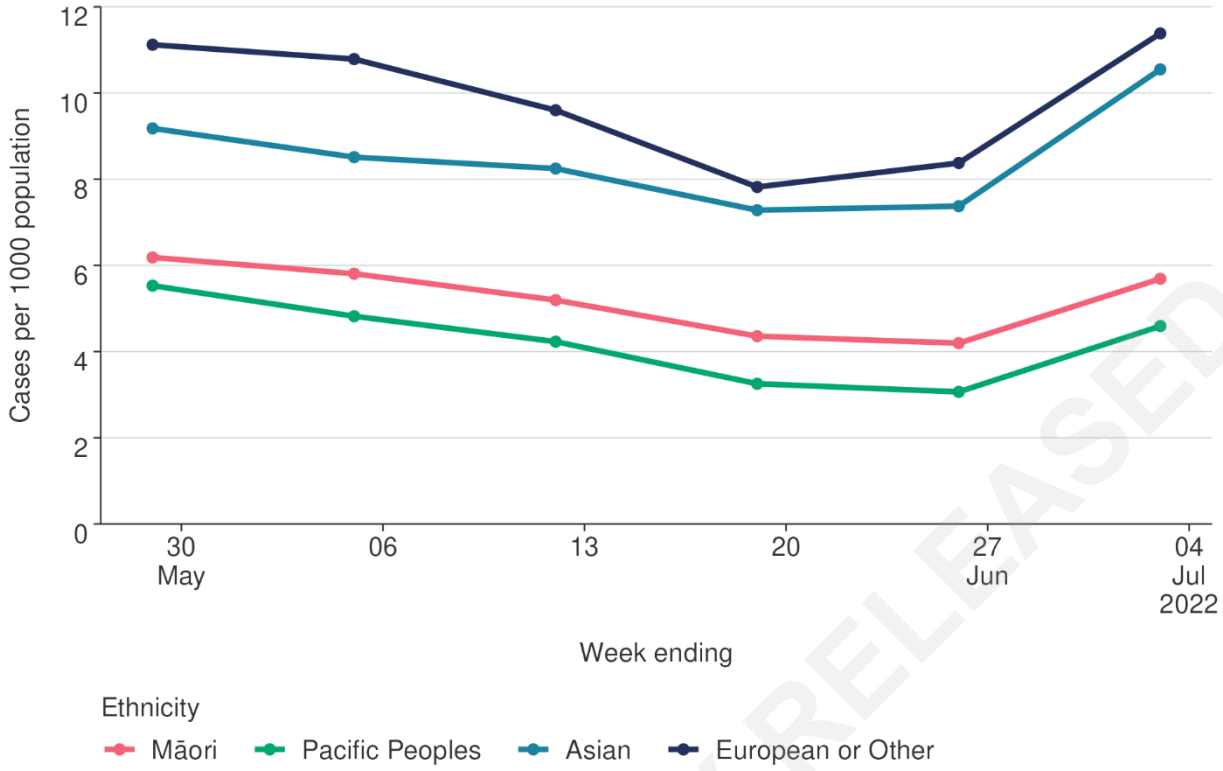
Figure 11 shows national case rates by ethnicity and a further breakdown by age group. The **highest case rates** out of any cohort were **within those aged 25-44 and 45-64 of European or Other ethnicity (12.9 per 1,000)** whilst the lowest case rates were in those aged 0-4 and 5-14 of Pacific Peoples ethnicity (2.2 per 1,000). 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+ increased significantly after stable trends in the past month. In the week ending 3 July, case rates for Asian aged 65+ were 7.5 per 1,000 (84% decrease from week prior). Case rates for European or Other aged 65+ were 11.6 per 1,000 (53% increase from week prior). **Case rates in Māori aged 65+ were 7.7 per 1,000 (51% increase from week prior). Case rates in Pacific People aged 65+ were 5.4 per 1,000 (23% increase from week prior).**

Case rates for those at higher risk of complications or severe illness from COVID-19, those aged 45-64 and those aged 65+, were highest in European or Other (45-64 at 12.9 per 1,000 and 65+ at 11.6 per 1,000).

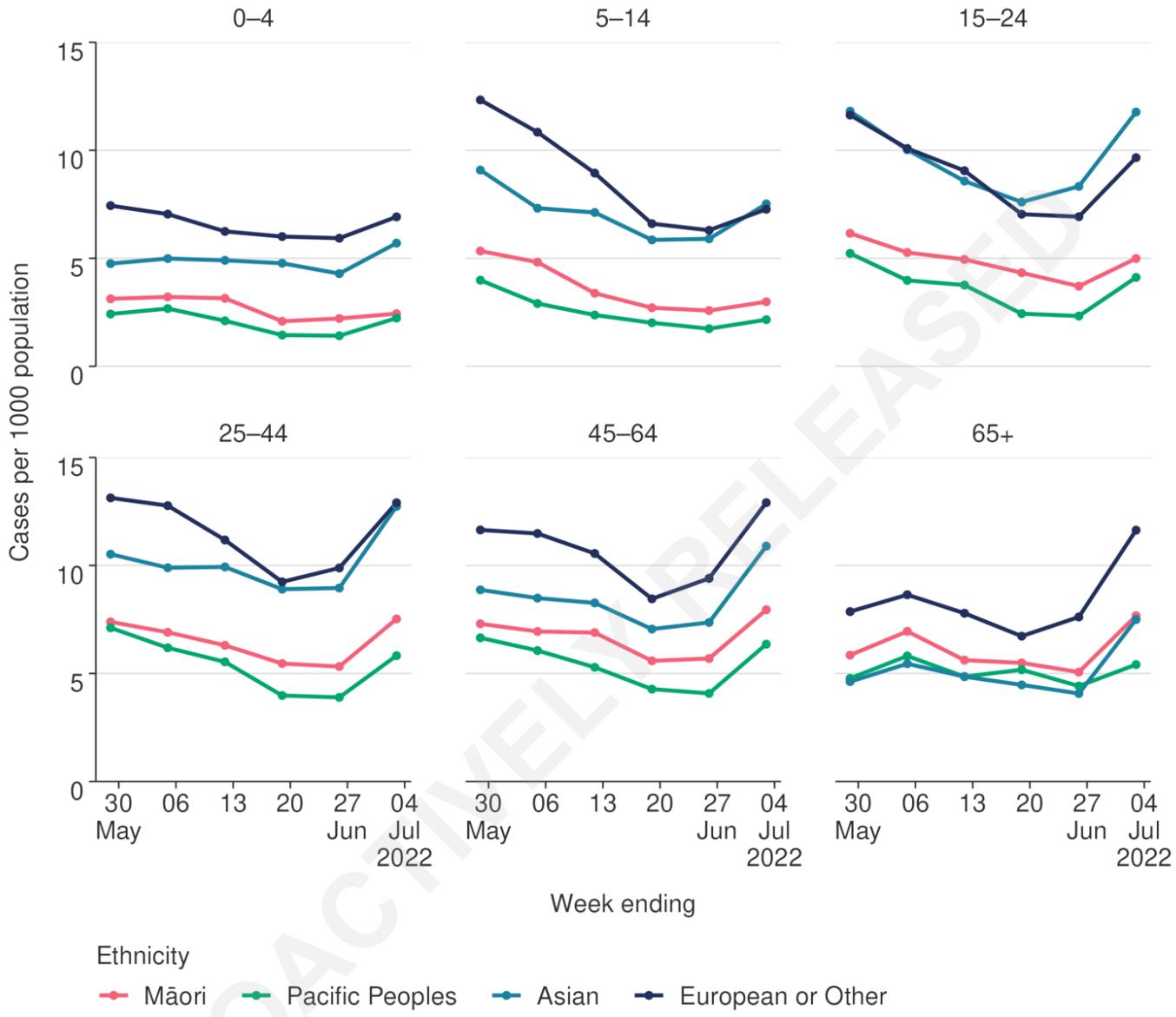
As Māori and Pacific Peoples have lower life expectancies than other ethnicities in Aotearoa New Zealand, they are likely to have a higher risk for COVID-19 complications at a younger age than other ethnicities.

Figure 10: National weekly case rates by ethnicity for weeks 29 May – 03 July 2022



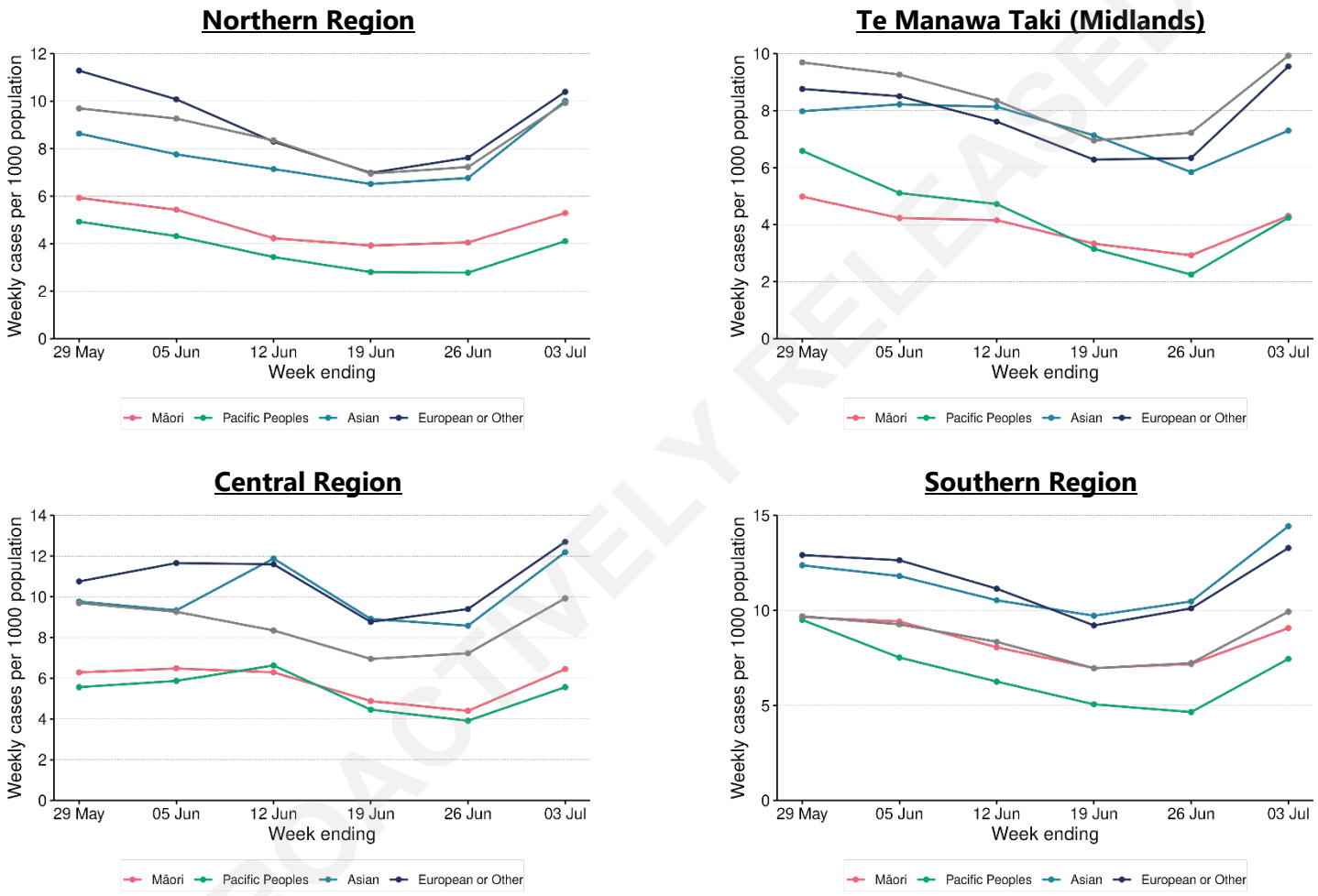
Source: NCTS/EpiSurv as at 2359hrs 03 July 2022

Figure 11: National ethnicity-specific weekly case rates by age group for weeks 29 May – 03 July 2022



Source: NCTS/EpiSurv as at 2359hrs 03 July 2022

Figure 12: Regional weekly case rates by ethnicity for weeks 29 May – 03 July 2022



Source: NCTS/EpiSurv as at 2359hrs 03 July 2022

Age trends over time and by region

Figure 13 shows community cases by age nationally. Case rates in older age groups (15-24, 25-44, 45-64 and 65+) have increased sharply, and case rates in the youngest age groups (0-4 and 5-14) have also increased, albeit to a lesser extent, in the past week. Nationally, case rates in the 65+ age group increased 54% from last week, to 10.9 per 1,000.

Nationally, **case rates were relatively similar for 0-4 and 5-14 age groups (5.1 and 5.8 respectively); 25-44 and 45-64 age groups (11.6 and 11.7 respectively)** in the past week. Those aged 0-4 continued to have the lowest weekly case rate at 5.1 per 1,000. The 25-44 and 45-64 age groups had the highest case rates at 11.6 per 1,000 and 11.7 per 1,000 respectively in the past week.

For the 0-4 age group, case rates in the Northern region increased by 27.5%, Te Manawa Taki increased by 21.9%, Central increased by 9% and Southern increased by 20.3%.

For the 5-14 age group, case rates in the Northern region increased by 18.1%, Te Manawa Taki increased by 23.1%, Central increased by 27.6% and Southern increased by 13.8%.

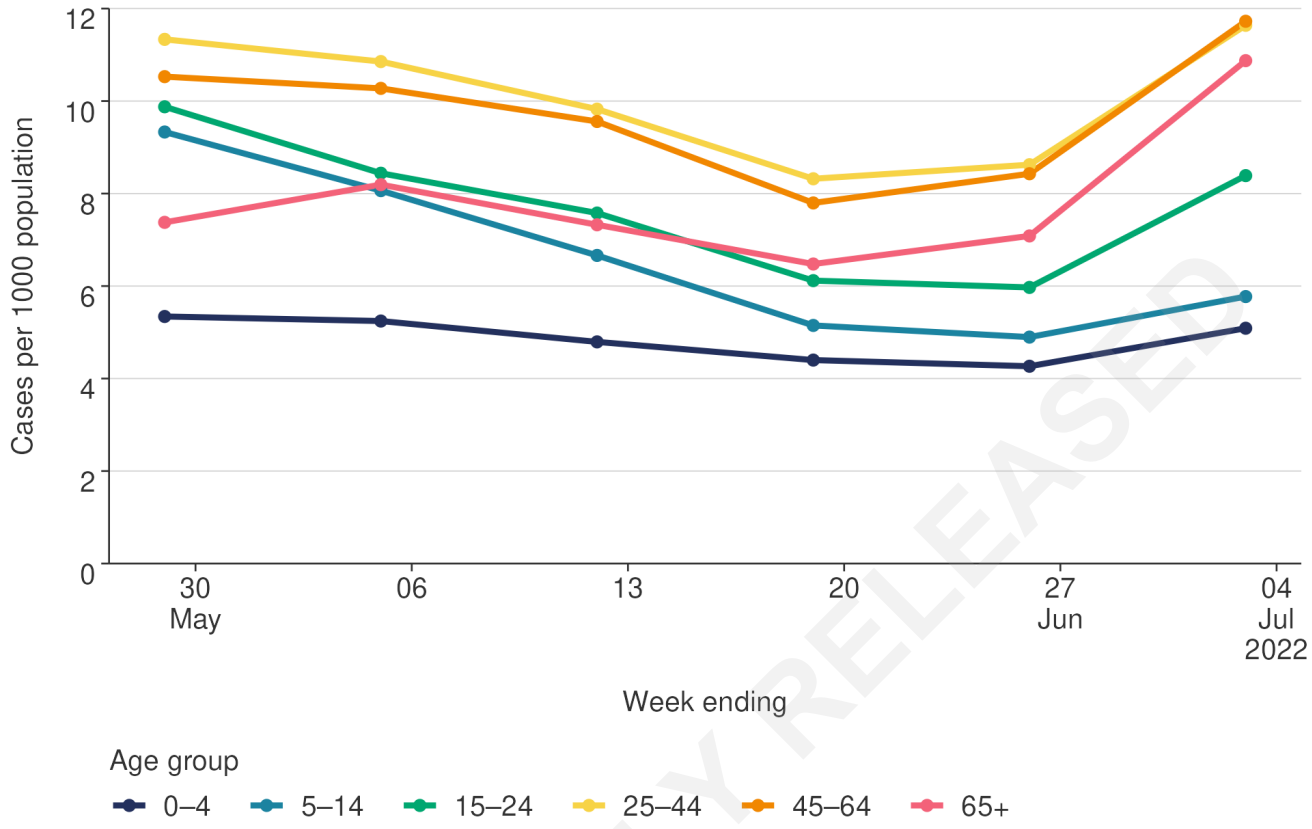
For the 15-24 age group, case rates in the Northern region increased by 35%, Te Manawa Taki increased by 57%, Central increased by 48.5% and Southern increased by 35.5%.

For the 25-44 age group, case rates in the Northern region increased by 40.9%, Te Manawa Taki increased by 38%, Central increased by 33.8% and Southern increased by 28.3%.

For the 45-64 age group, case rates in the Northern region increased by 41.6%, Te Manawa Taki increased by 61.9% , Central increased by 34.0% and Southern increased by 33.2%.

For the 65+ age group, case rates in the Northern region increased by 58.7% , Te Manawa Taki increased by 53.3%, Central increased by 55.4% and Southern increased by 51.0%.

Figure 13: National weekly case rates by age for weeks 29 May – 03 July 2022



Source: NCTS/EpiSurv as at 2359hrs 03 July 2022

Deprivation trends over time, by ethnicity and by region

Figure 14 shows case rates based on the NZDep2018.[5] 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 areas of least deprivation (12.3 per 1,000 population),** followed by areas of mid-range deprivation (10.6 per 1,000) and areas most deprived (7.1 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 are likely to be exacerbated in areas of higher deprivation. Thus, it is unlikely that as large a difference in case rates exists between those of low and high deprivation and that a higher level of case under-ascertainment exists in areas of higher deprivation. Furthermore, it is likely that high infection rates in deprived areas earlier in the outbreak could be impacting current trends in deprived groups.

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 (9.6 and 9.1 per 1,000 respectively). Case rates in Pacific Peoples were the lowest in every deprivation level, while cases 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 12.8 per 1,000 followed by Asian (11.2 per 1,000).

For the most deprived areas, cases in Māori made up 17% of cases. The proportion of cases in the most deprived areas for Pacific Peoples was 8%, for Asian 17% and for European and Other, 58%. Following this, 80% of cases in areas of least deprivation were European and Other compared with 13% Asian, 5% Māori and 2% Pacific Peoples.

In the Northern region, case rates were highest in the least deprived areas (10.6 per 1,000 population) followed by areas of mid-range deprivation (10.2 per 1,000) and areas most deprived (5.7 per 1,000).

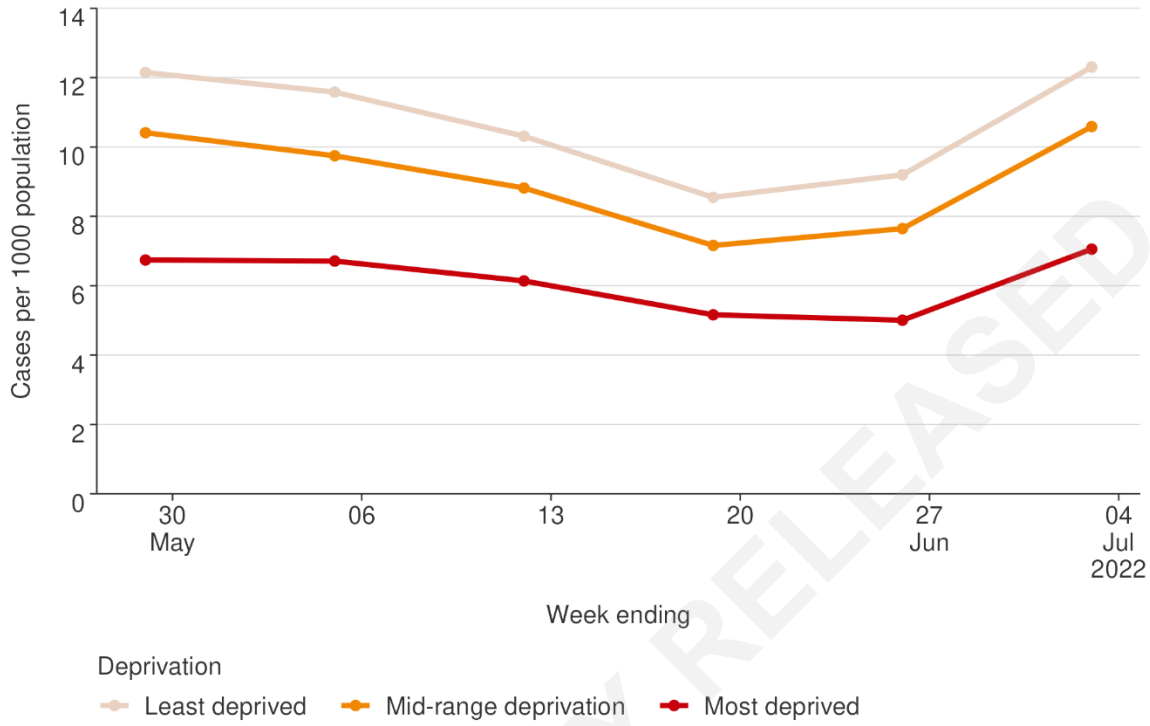
In Te Manawa Taki region, case rates were highest in the least deprived areas (10.1 per 1,000) followed by areas of mid-range deprivation (8.3 per 1,000) and areas most deprived (6.4 per 1,000).

In the Central region, case rates were highest in the least deprived areas (14.4 per 1,000) followed by areas of mid-range deprivation (11.7 per 1,000) and areas most deprived (7.5 per 1,000).

In the Southern region, case rates were highest in the least deprived areas (14.7 per 1,000) followed by areas of mid-range deprivation (12.5 per 1,000) and areas most deprived (11.0 per 1,000).

[5] Contents (otago.ac.nz)

Figure 14: National weekly COVID-19 case rates by deprivation status for weeks 30 May – 03 July 2022



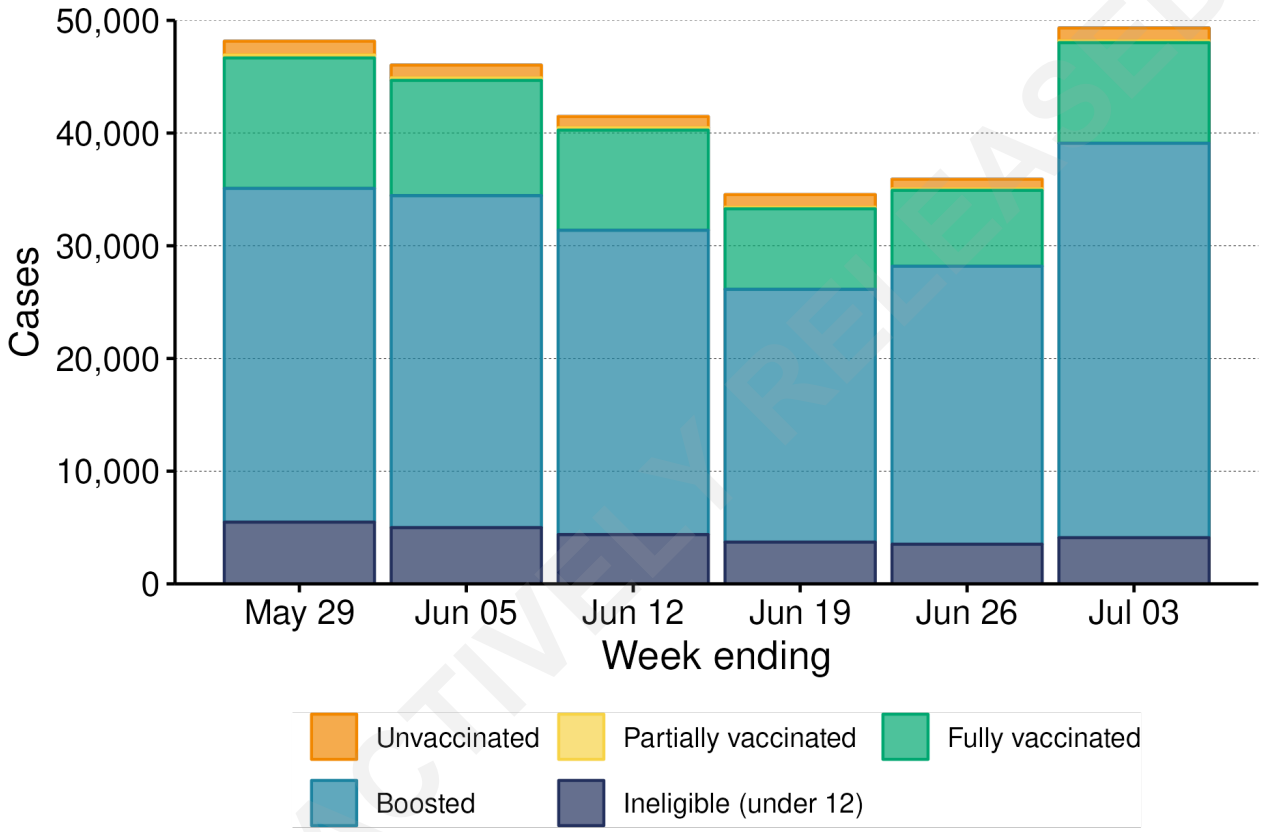
Source: NCTS/EpiSurv as at 2359hrs 03 July 2022

Vaccination trends over time

Figure 15 shows community case numbers by vaccination status nationally. In the week ending 03 July, the proportion of boosted cases was 71% of all cases, while the proportion reported as fully vaccinated was 18.1% of all cases.

The proportion of cases amongst those who are categorised as ineligible due to being under 12 years old[6] was 8.3%. The proportion of cases reported as partially vaccinated remains constant at 0.3%, and cases reported in those unvaccinated were also constant at 2.3%.

Figure 15: National weekly case numbers by vaccination status for weeks 29 May – 03 July 2022



Source: NCTS/EpiSurv as at 2359hrs 03 July 2022

[6] Cases deemed Ineligible (under 12) are currently all cases that fall under the age of 12. Modifications to vaccination categories are being developed, which will include under 12s.

PCR and RAT testing trends

Since New Zealand entered Phase 3 of the Omicron response, most testing is 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 rate and positivity data are not fully representative of the current testing state of New Zealand.

Whole Genomic Sequencing of Community cases

This week, all three watchlist variants (BA.2.12.1, BA.4 and BA.5) were again detected in community samples (first detected in late May/early June) with increasing frequency. Wastewater data also continues to detect BA.4/5 and BA.2.12.1 at a number of sites. Wastewater data coupled with community case WGS results strongly suggests that BA.4/5 and BA.2.12.1 are circulating within the wider NZ population. **The upward rise of the BA.5 variant of Omicron is a key observation – it now makes up approximately one third of community cases. ESR estimates that BA.5 will likely become the dominant variant next week.** There is high certainty that BA.5 is largely responsible for rising case numbers across the country (and internationally).

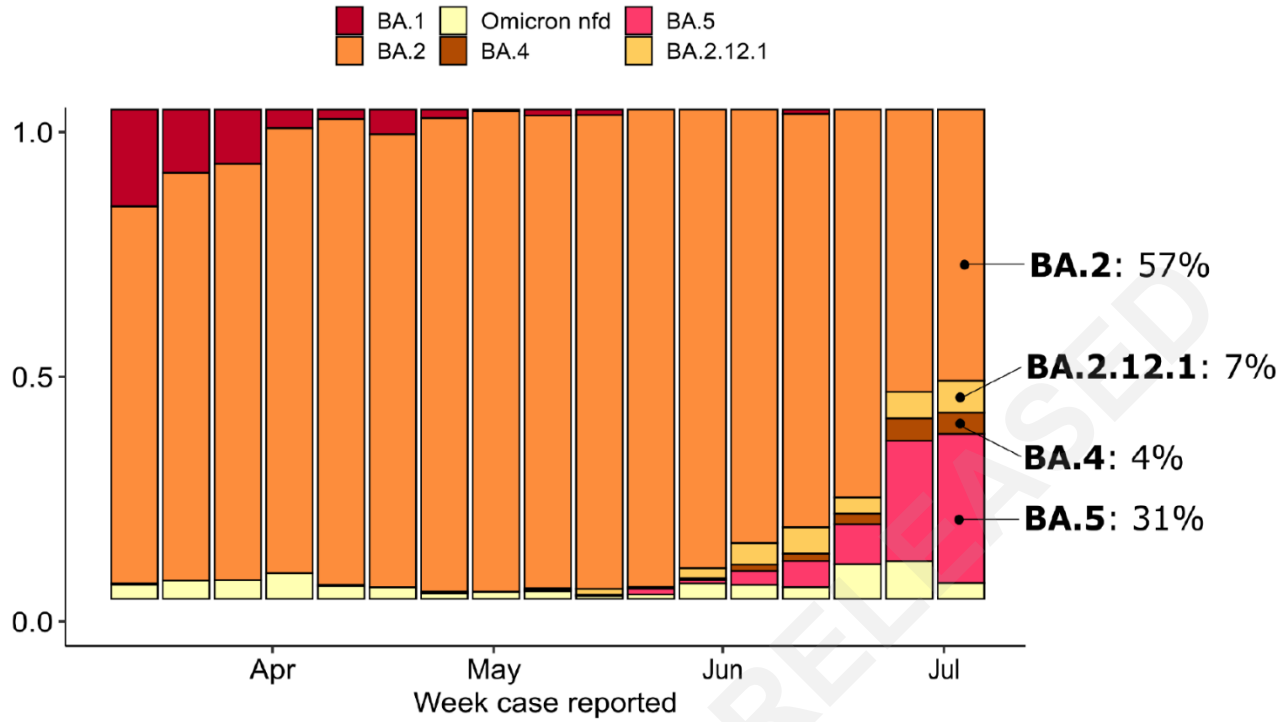
Figure 16 shows that Omicron is the dominant variant in New Zealand having outcompeted Delta, which made up ~70% of all sequenced cases at the start of January 2022, but fell to less than 10% of sequenced cases by the end of January 2022.

BA.2 made up about 57% of sequenced community cases in the past week. **Figure 16 also shows the increasing frequency of BA.4/5 and BA.2.12.1 in community samples over the past few weeks.** As expected, in NZ we see a (relative) growth advantage of BA.5 over other variants. We expect BA.5 to outcompete BA.2; as mentioned above, ESR expect this will happen next week.

A recent subvariant BA.2.75 looks to be gaining a global foothold. So far, there are 4 reported cases found within NZ – all are associated with the border. As yet, there is no indication of community spread of BA.2.75.

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

Figure 16: ***Frequency of Variants of Concern in community cases in New Zealand***



Source: ESR COVID-19 Genomics Insights Report #12, EpiSurv/Microreact 0900hrs 04 July 2022

Border Surveillance

Cases detected at the Air Border

Imported cases initially increased as travel volumes increased after the first stage of border reopening in March. Detected cases then remained roughly constant through May and 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. By 28 June, 3.5% of recent arrivals were reporting a positive test.

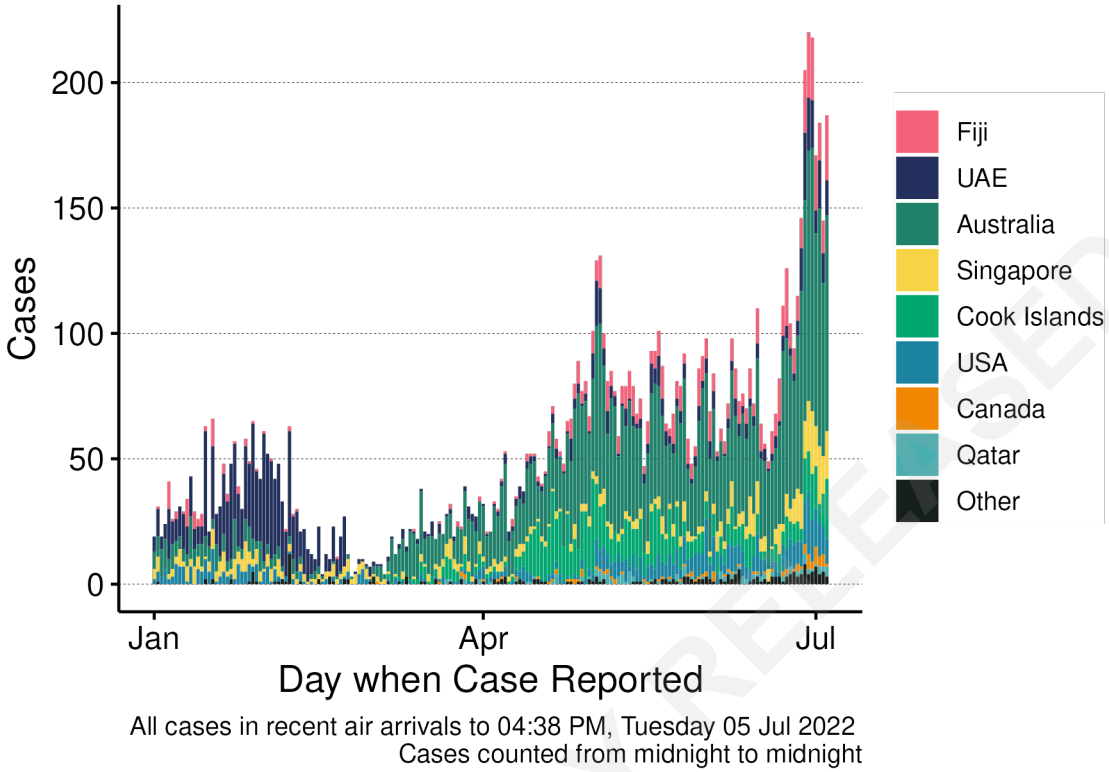
Figure 17 shows the number of RAT-positive cases in arrivals since January 2022. Before Reconnecting New Zealand dropped most of the quarantine requirements, most active cases were on the long-haul flights via the UAE. From then until 19 June, while pre-departure tests were required, most cases arrived on flights from Australia followed by the Cook Islands and Fiji, then the USA. Since 20 June, there has been an increase in cases detected on the flights **from Australia, UAE, Singapore, the Cook Islands and Fiji.**

The spike in cases on 2 May was on the first day that citizens of visa-waiver countries could enter without quarantine.

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 records only countries visited in the weeks before the Declaration is filled in.

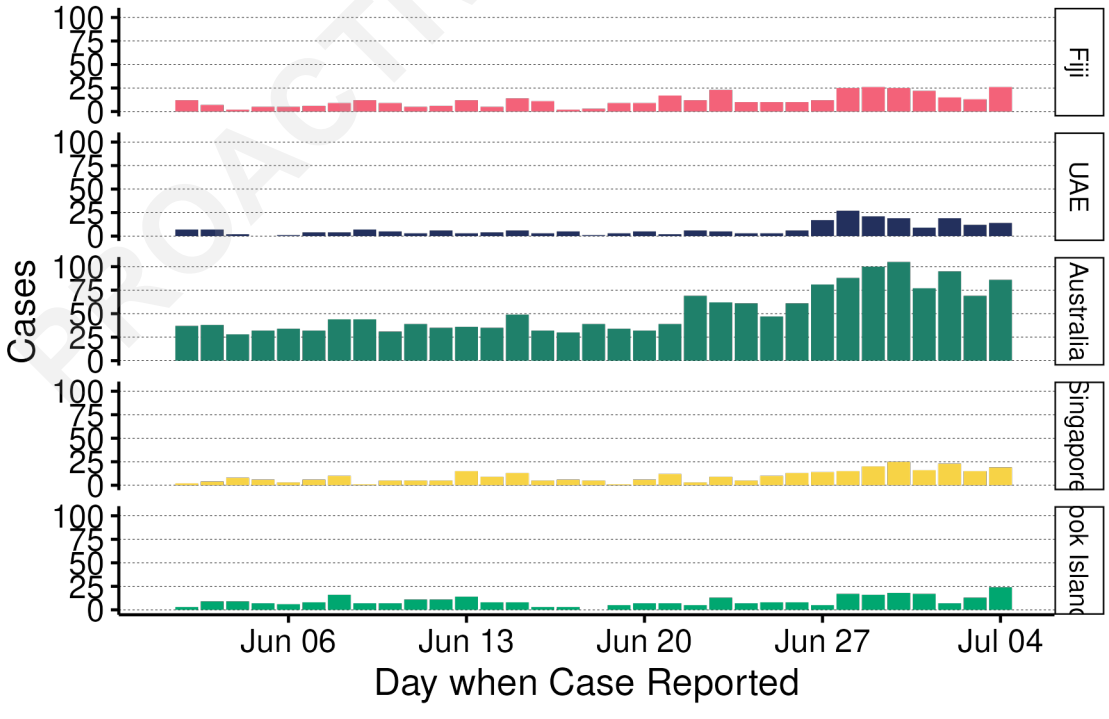
While the increase since 20 June was rapid, it is in line with expectations for the removal of pre-departure testing. Even with this increase, the total number if cases detected at the border is much less than the number reported each day in the community.

Figure 17: Cases reported in post-arrival testing by country of flight departure, 01 January – 04 July 2022



Source: NCTS/EpiSurv as at 2359hrs 4 July 2022

Figure 18: Cases reported in post-arrival testing, by the five flight-departure countries with most cases reported in the seven days to 4 July 2022

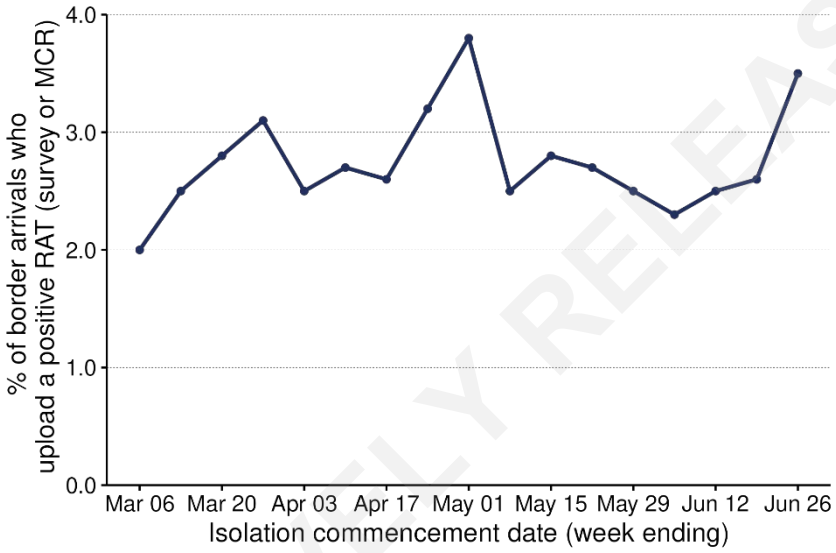


Testing of Border Arrivals

Figure 19 shows that the percentage of positive RATs in border arrivals who reported a test was mostly between 2 - 4% for the period 06 March – 26 June 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%, but in the past week this has jumped to 3.5% (1,678 of 48,072 arrivals). Last week we predicted that rates were likely to rise this week as more day 5 tests from recent arrivals are reported.

Rates per traveller are rising as expected in the fortnight after 20 June, when pre-departure tests were no longer required.

Figure 19: Percentage of positive tests in border arrivals who report RATs, 06 March – 26 June 2022



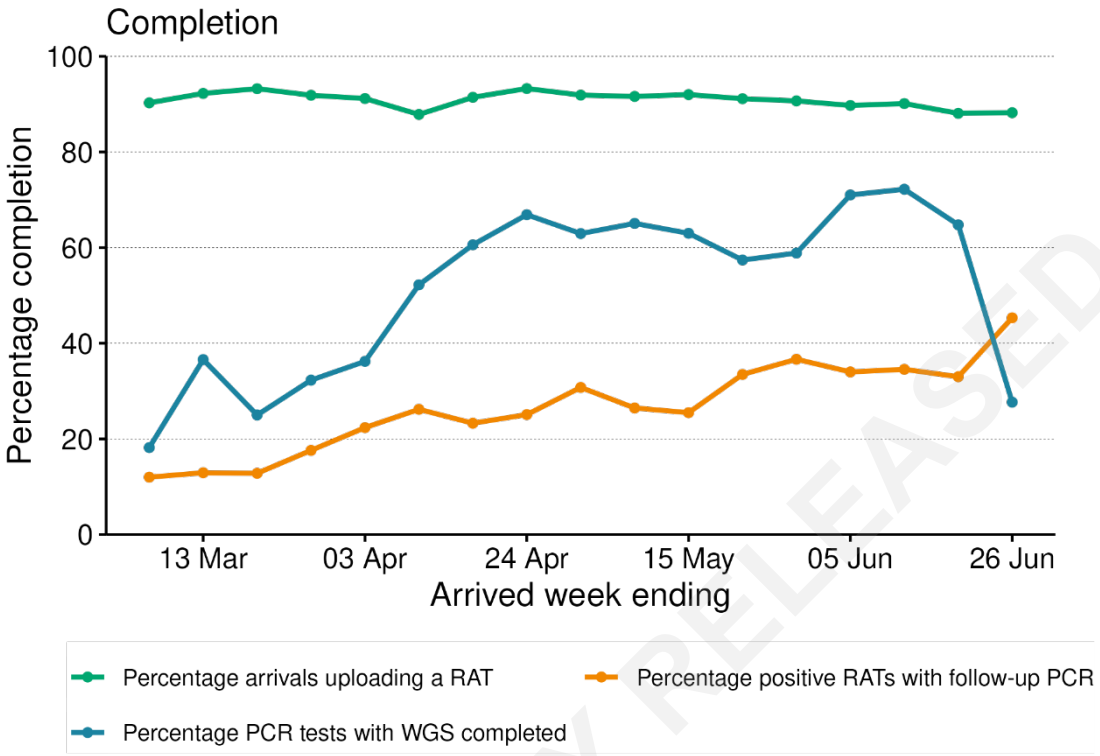
Sources: NCTS/EpiSurv/Éclair as at 2359hrs 03 July 2022

Whole Genomic Sequencing of Imported cases

Figure 20 shows the completion metrics for border returnee testing and WGS from 7 March to 26 June 2022. The percentage of arrivals uploading a RAT has been constant with an average of 91%. In the week ending 26 June, there were 48,072 border arrivals, of whom 88.2% (42,413) uploaded a RAT result upon arrival. This is similar to 88.1% in the week prior.

Genomic sequencing data is lagged by 1 or 2 weeks because of the time needed for recent arrivals to report a positive RAT, seek a follow-up PCR and for it to be processed by ESR.

Figure 20: Completion metrics for border returnee testing and WGS for arrivals, 06 March – 26 June 2022



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 26 June 2022, ESR WGS 26 June 2022[7]

Figure 21 shows the border returnee testing and WGS metrics for arrivals. In the week ending 26 June, **45.5% of border arrivals who returned a positive RAT had a follow-up PCR test**. This is a relatively large increase compared to 32.6% the week prior, and is the largest weekly increase we have seen in months.

In the week ending 26 June, the percentage of PCR positive border arrivals with WGS complete was 27.6%. The figure will rise as more of the recent cases are processed: It is now 64.8% for the week ending 19 June and 72.2% for the week ending 12 June. **Figure 21** 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 or BA.2.12.1. These cases include the first reports of BA.2.75 in travellers to New Zealand. This lineage has not yet been detected in cases unlinked to the border. As at 6:00pm 03 July, ESR had received samples from 460 of the 1248 PCR-positive border cases with a report date in the two weeks to 24 June. Seven samples failed WGS and 229 have not yet been sequenced. Of the successfully sequenced samples, <1% were BA.1, 42% were BA.2, 10% were BA.2.12.1, <1% BA.2.75, 10% were BA.4, 37% were BA.5, and <1% were Omicron (unassigned).

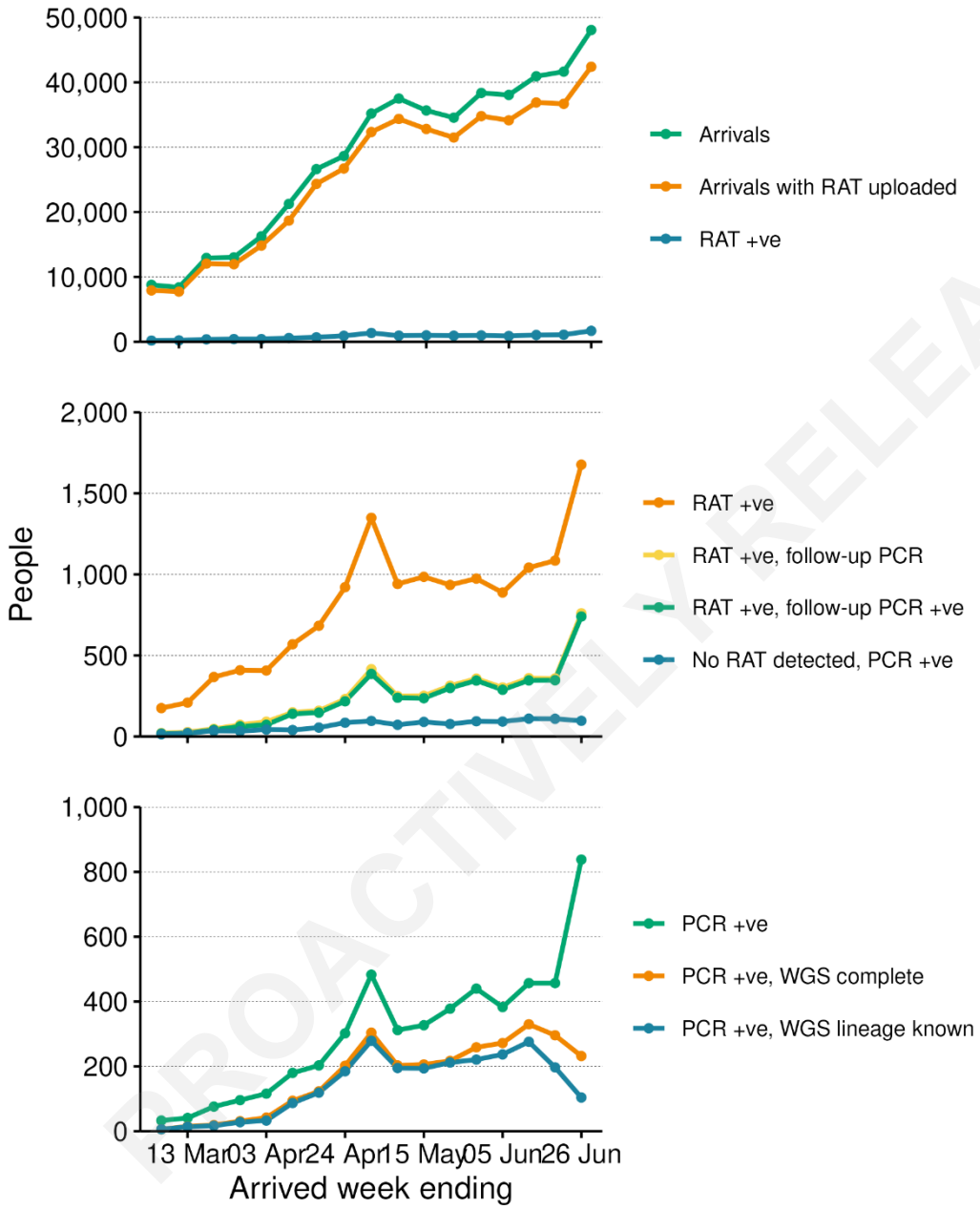
A case can only be referred to ESR for whole genomic sequencing (WGS) if the traveller is referred to PCR testing and the lab then sends the PCR sample on.

Testing and reporting at the border is 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 21: Border returnee testing and WGS metrics for arrivals, 13 March – 26 June 2022



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 19 June 2022, ESR WGS 26 June 2022[8]

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

Hospitalisation and Mortality

Hospitalisation Rates

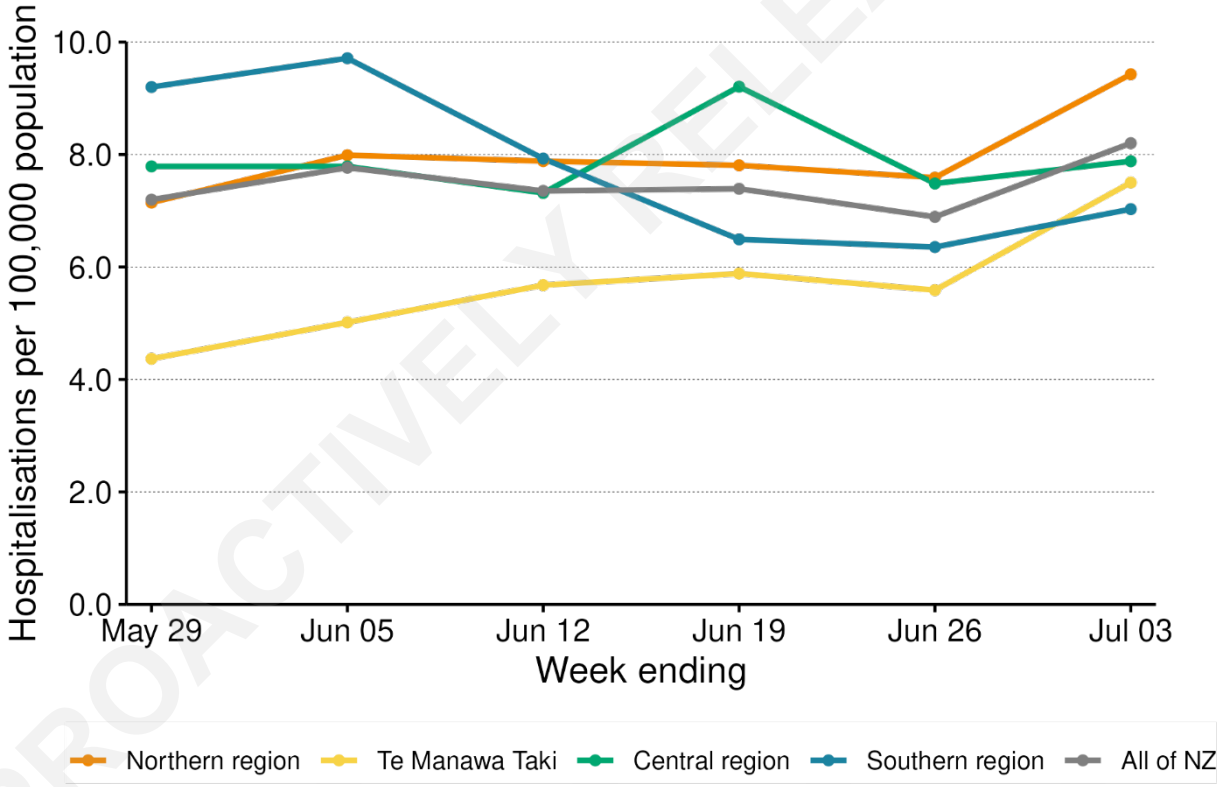
Due to varying definitions of an active case, there may be regional differences in the coding of COVID-19 infection status for hospitalisations.

Hospital Occupancy

For the week ending 03 July, the national hospital occupancy rate was 8.2 per 100,000 population, an increase of 19% from the week prior **(Figure 22)**.

Hospital occupancy rates increased across all regions in the past week. The Northern region (9.4 per 100,000) increased by 24%, Te Manawa Taki (7.5 per 100,000) increased by 34%, Central region (7.9 per 100,000) increased by 5% in the past week and Southern (7.0 per 100,000) increased by 11%.

Figure 22: Regional weekly hospital occupancy rate per 100,000 population, 29 May – 03 July 2022



Source: Daily hospital questionnaire as of 03 July 2022

Whole Genomic Sequencing of hospitalised cases

As of 03 July, ESR received samples from and had processed 69 of the 421 PCR positive hospital cases with a report date in the two weeks to 01 July 2022. Of these, 74% had a BA.2 genome, 9% were BA.2.12.1, and 17% were BA.5.

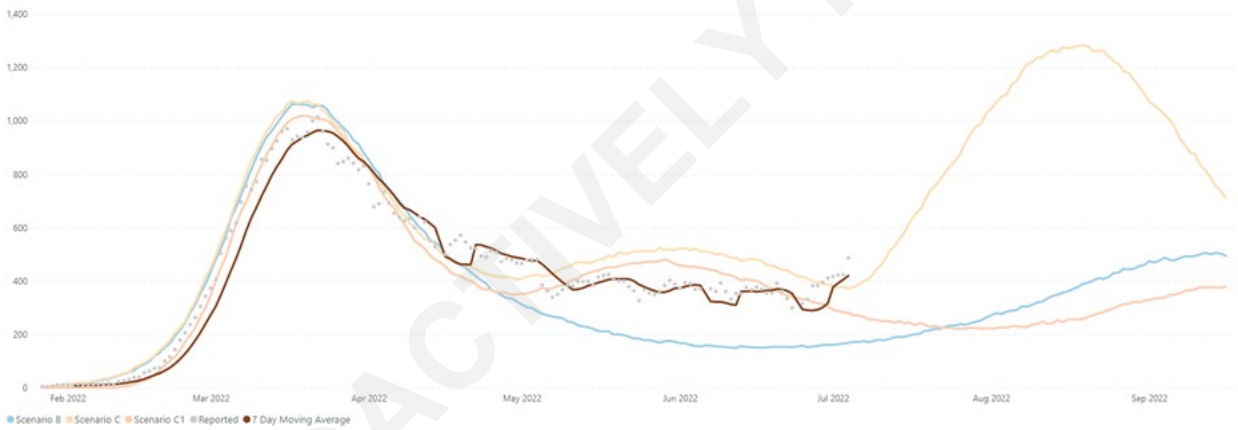
ESR receives a daily list of active COVID-19 cases who tested positive in the past 14 days and were hospitalised in the past 7 days. ESR is working with the Ministry of Health to receive information indicating which cases have been admitted to ICU or HDU.

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 cases with the BA.2 scenarios published to DHBs in April 2022. **See** Error! Reference source not found. **above for new scenarios for BA.5.**

The number of hospital beds occupied by people with confirmed COVID-19 infections was approximately between 8 and 9 per 100,000 population in the last week, **an increase above the declining trend of previous weeks**. This count includes infected people hospitalised for any reason, and at a national level is tracking at around the BA.2 scenario *C*, which expected an increase in hospitalisations due to waning immunity and increasing transmission even before the arrival of BA.5.

Figure 23: CMA hospital occupancy scenarios compared to actual hospital occupancy



Sources: COVID-19 Modelling Aotearoa (CMA) Branching Process Model April 2022, and District reports to TAS of daily hospital occupancy (all COVID-19 positive people admitted as inpatients) as of 4 July 2022.

Mortality

Figure 24 shows the 7-day rolling average of deaths within 28 days of case report by date of death, which was 12 as of 03 July 2022. Under-ascertainment of COVID-19 cases in the community could mean that the true 7-day rolling average of deaths is higher than reported.

Figure 25 shows **COVID-19 related deaths by cause over time**. From March 2020 to 04 July 2022, there were 1,512 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 these deaths that have been formally coded by cause of death, 683 **(50%) were determined to have COVID-19 as the main underlying cause**. COVID-19 **contributed to a further 367 deaths (27%).** Another 305 people died of a separate, unrelated cause (23%).

Figure 26 shows mortality by age and ethnicity from 1 March to 03 July 2022, the period when most cases were due to the Omicron variants. The trend is as expected across all ethnicities, with older populations dying with COVID-19 at a higher rate than younger people. The **mortality rate for those aged 90+ is highest at 17.7 per 1,000 population.** The mortality rate for those aged 80-89 is 4.3 per 1,000; and for those aged 70-79 is 1.1 per 1,000. The mortality rate for younger age groups is far below 1 per 1,000 population (ages 0-49: 0.02 per 1,000; ages 50-59: 0.1 per 1,000; ages 60-69: 0.3 per 1,000).

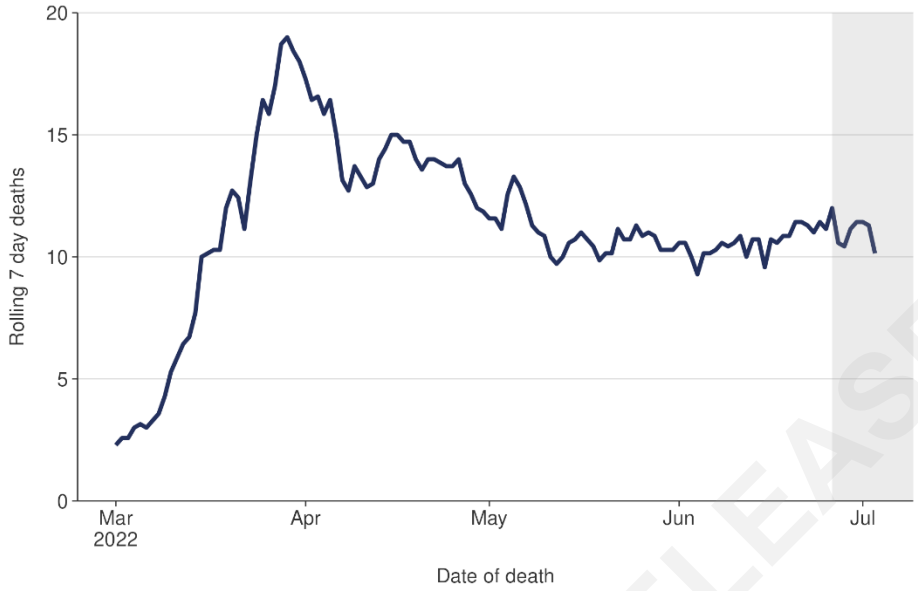
Across age groups, **Pacific and Māori have consistently higher mortality than Asian and European or Other** ethnicities. However, these age-stratified deaths by ethnicity are based on small numbers of events meaning that some rates have wide confidence intervals (CI)[9] and are not statistically significantly different from other rates.

Of people aged 90+, Pacific Peoples had the highest mortality rate at 62.3 per 1,000 population (95% CI 35.6 – 101.1 per 1,000), while Asian ethnicity had the lowest rate at 9.3 per 1,000 (95% CI 3.4 – 20.2).

For people aged 80-89, Pacific Peoples had the highest mortality rate at 17.2 per 1,000 population (95% CI 12.7 – 22.7), while Asian was again the lowest at 2.4 per 1,000 (95% CI 1.4 – 3.8).

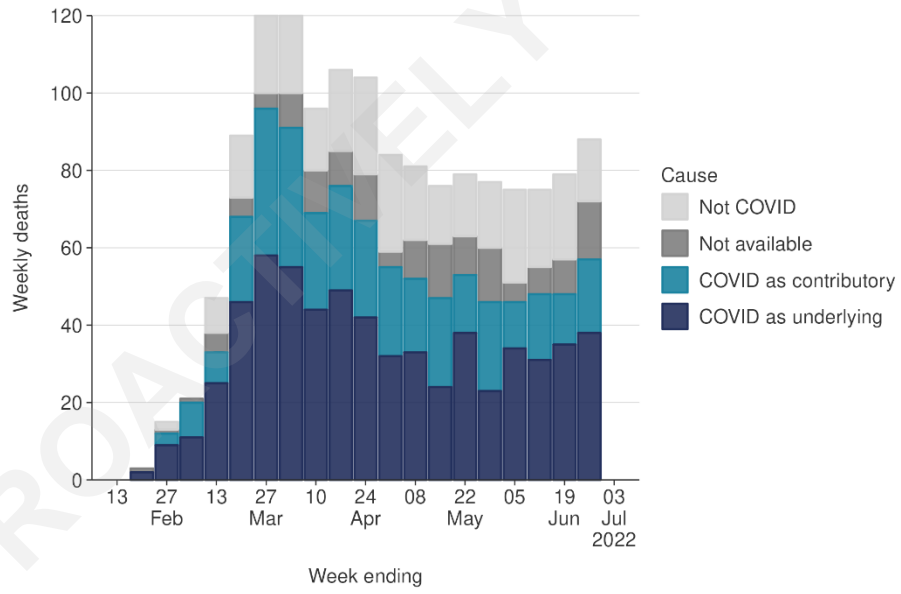
[9] *Mortality data, even based on complete counts, may be affected by random variation—that is, the number of deaths that actually occurred may be considered as one of a large series of possible results that could have arisen under the same circumstances. When the number of deaths is small, perhaps fewer than 100, random variation tends to be relatively large.* (Excerpt from https://stacks.cdc.gov/view/cdc/79486 - page 72). Confidence intervals allow us to give a reasonable range for our rates which are based on a small number of events. They account for the natural, random variation inherent in deaths and illnesses (See Brillinger 1986 - The Natural Variability of Vital Rates and Associated Statistics). A 95% confidence interval means we are 95% confident that the rate would fall within the given interval if we were to measure the number of deaths again under the same circumstances.

Figure 24: 7-day rolling average of deaths within 28 days of being reported as a COVID-19 case, by date of death, 01 March – 03 July 2022



Source: NCTS/EpiSurv as of 03 July 2022[10]

Figure 25: Deaths by cause, 01 March – 03 July 2022



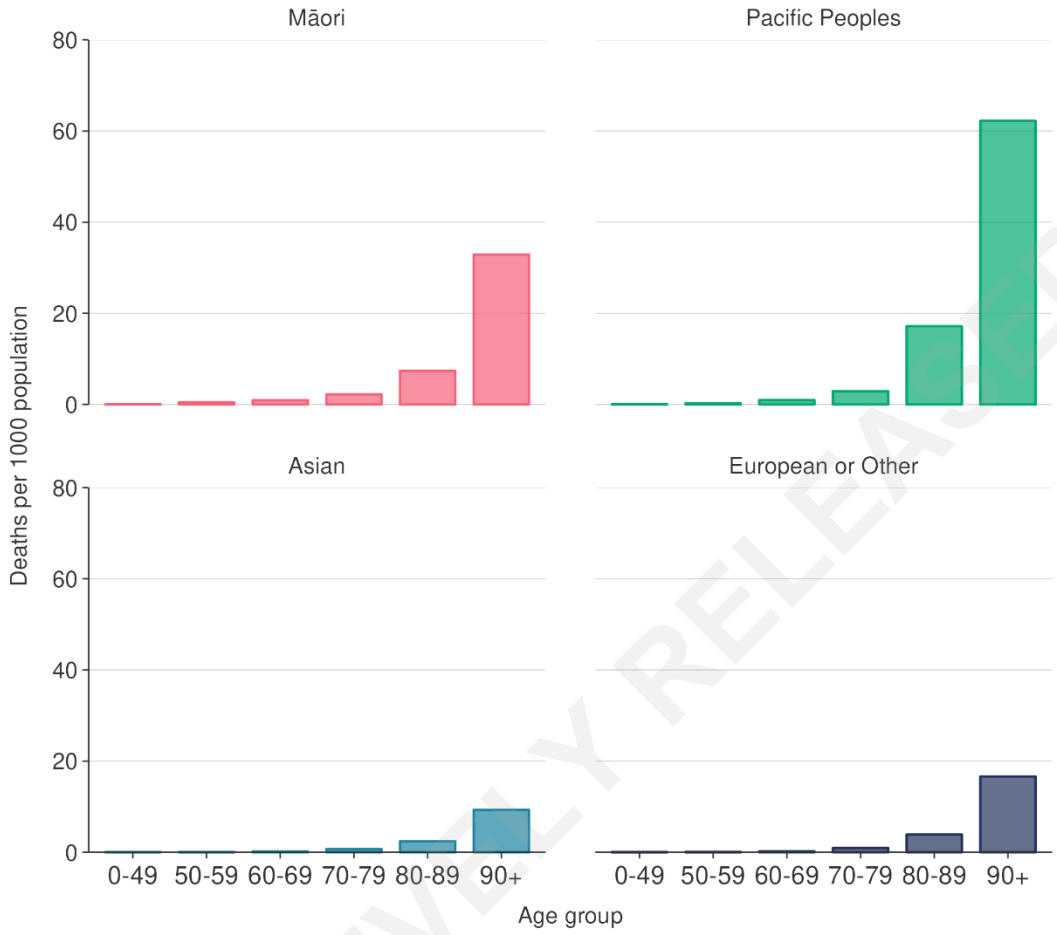
Source: Ministry of Health, all 2022 deaths by date of death within 28 days of report as COVID-19 case, and all other 2022 deaths where COVID-19 was the underlying or a contributory cause

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 with an existing health condition combined with COVID-19.

[10] In the shaded grey area, additional deaths may still be pending report.

Figure 26: Rates of all deaths with or after COVID-19 infection per 1000 population, by age and ethnicity, 01 March – 03 July 2022



Source: NCTS/EpiSurv as of 03 July 2022

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, the number of new weekly cases increased for the fourth consecutive week after a declining trend since the last peak in March 2022. During the week of 27 June to 3 July 2022, over 4.6 million cases were reported, a figure similar to that of the previous week. The number of new weekly deaths declined by 12% as compared to the previous week, with over 8100 fatalities reported.

At the regional level, the number of new weekly cases increased in the Eastern Mediterranean Region (+29%), the South-East Asia Region (+20%), the European Region (+15%) and the Western Pacific Region (+4%), while it decreased in the African Region (-33%) and the Region of the Americas (-18%). The number of new weekly deaths increased in the Eastern Mediterranean Region (+34%) and the South-East Asia Region (+16%), while decreases were observed in the African Region (-50%), the Region of the Americas (-13%), the European Region (-12%) and the Western Pacific Region (-12%). As of 3 July 2022, over 546 million confirmed cases and over 6.3 million deaths have been reported globally.

The Omicron VOC continues to be the dominant variant circulating globally, accounting for 92% of sequences reported to GISAID between 1 and 30 June 2022. The remaining 8% waiting to be assigned are (presumed Omicron), Delta VOC and recombinants. Among Omicron lineages, the proportions of BA.5 and BA.4 continue to increase. BA.5 has been detected in 83 countries, and from 19 to 25 June, the proportion of BA.5 among all sequences submitted weekly to GISAID increased from 37% to 52%. Although BA.4 is also rising globally, the rate of increase is not as high as that of BA.5. BA.4 has been detected in 73 countries, and now accounts for 12% of all sequences submitted from 19 to 25 June (up from 11% in the previous week). BA.4 and BA.5 share similar mutations in SARS-CoV-2 spike but have different mutations in non-spike regions.

Globally, the proportions of Omicron lineages BA.2 and BA.2.12.1 have decreased. From 19-25 June, the prevalence of BA.2 among all sequences submitted to GISAID was 9% (a decrease from 16% in the previous week) and the prevalence of BA.2.12.1 was 11% (a decrease from 19% in the previous week). BA.2 and BA.2.12.1 have been reported in 150 and 84 countries, respectively. There is no evidence yet regarding any change in severity with BA.4, BA.5 or BA.2.12.1 as compared to BA.2. However, the rise in prevalence of BA.2.12.1, BA.4 and BA.5 has coincided with an increase in cases in several WHO regions. In some countries, the rise in cases also resulted in a surge in hospitalisations, ICU admissions and deaths. In countries where the incidence of BA.4, BA.5 or BA.2.12.1 cases is now declining, the rise in cases, hospitalisations, ICU admissions and deaths have been lower as compared to the previous BA.1 and/or BA.2 waves.

Australia

Australia's Health 2022, a report released by the Australian Institute of Health and Welfare was released 7 July 2022. It reports Australia's infections, hospitalisations and deaths reaching their highest levels during the 4th wave (Omicron outbreak) late 2021 and into early 2022. The case fatality rate of COVID-19 related deaths has fallen from a peak of 3.3% in October 2020 to 0.1% in April 2022 which corresponded with the rollout of the national vaccination program. COVID-19 mortality rates affected vulnerable populations disproportionately in Australia with rates nearly 3 times as high for those living in the lowest socioeconomic area compared with the highest socioeconomic area (age-standardised). Mortality was also 2.5 times as high for those born overseas with those born in North Africa and the Middle-East most affected.

At the state level, new cases are being recorded in Northern Territory, South Australia, Tasmania, Victoria and Western Australia over the past week. Western Australia currently has the most new cases with 4,985 locally acquired and 71 acquired overseas in the 24 hours up to 6 July. South Australia has the second-most new cases with 3,993 locally acquired and 19 acquired overseas. New South Wales, however, has the highest number of active cases at 124, 706, close to half the national total which is currently 282,003.

India

India's COVID-19 infections increased in the last two weeks by ~78%. Deaths have simultaneously increased 125%, but absolute numbers remain low. Active cases crossed the 100,000 mark for the first time in 3 months. Although BA.2 remains dominant in the country, BA.5, with a significant growth advantage and immunity escaping properties, is said to be replacing it.

Indonesia

COVID-19 infections have increased by ~240%, however, deaths have reduced by ~6% in the last two weeks in Indonesia. The more transmissible BA.4 and BA.5 variants have been detected in the country and might lead to a further surge in infections. There was a 0.1% increase in people protected, likely driven by the high infection rate.

Japan

A ~15% increase in infections and 34% increase in deaths have been observed in Japan over the last two weeks. Japan gradually began opening its borders earlier this month, leading to increased mixing, and could be responsible for this increase, along with the BA.5 variant with a significant growth advantage, which makes up 19% of current cases.

United Kingdom

The latest Office for National Statistics (ONS) infection survey found the percentage of people testing positive across the UK is increasing, likely due to the BA.4/5 variants. Scotland had the highest average percentage of the population testing positive out of all the UK countries at 5.47% continuing a trend of increasing test positivity from last week where positivity was 3.36%.

NHS Greater Glasgow and Clyde (NHSGGC), Scotland's largest health board, is reporting that inpatients testing positive has doubled in the past fortnight, placing strain on healthcare services. The deputy medical director for acute services has asked the public to stay away from A&E unless their condition is urgent or life-threatening. This plead coincides with the Scottish government's pledge to eradicate long NHS waiting times that have accumulated over the pandemic by August.

Wales is experiencing similar healthcare system strain with 10% of healthcare workers absent from work due to COVID-19 illness. All seven Welsh health boards have reintroduced masking for hospital visits after removing them earlier this year and one has reinstated a temporary ban on visits. Like Scotland, the public is being urged to avoid emergency departments except in cases of life-threatening illnesses or severe injury.

USA

COVID-19 infections have increased by ~5% and deaths by ~21% in the last two weeks up to 1 July in the US. The average daily number of cases has been stable this month. However, the growth of the more transmissible and immune escaping BA.5 variant has grown 21%, while BA.2.12.1 prevalence decreased by 16.5% in the last 2 weeks.

The US CDC report that the BA.4/5 sublineages of Omicron now make up over 70% of variants in the US. Unlike in European countries where BA.4/5 is dominant, reported infection rates are not sharply rising in the US, although COVID-19 hospitalisation rates have been rising since early June. Insufficient testing and reporting lags due to recent public holidays may be contributing to this infection rate trend, as may the decline in BA2.12.1 cases that could be masking the increase in BA.4/5.

Primary evidence on effectiveness of infection prevention and control measures

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

- A evidence brief on the properties of the Omicron variants and it affects public health measures effectiveness found that the effects of early isolation, adult-focused reduction of interpersonal contact, and vaccination targeting adults that because those interventions have different sites of action in infection spread dynamics 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 could add a cumulative 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. Noting the absence of a quantitative framework in Aotearoa, work is underway at ESR, Massey University, and University of Auckland to build models that use historical data and standardisation approaches to reliably determine active case numbers from measures of viral wastewater RNA in catchments. The aim of this programme is to transition wastewater-based surveillance (WBS) from a monitoring tool to one that has predictive potential.

- 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, with the highest risk among individuals living in the most deprived areas and a negative social gradient for testing rate. The findings indicate structural barriers to health-access in France and lower capacity of deprived populations to benefit from protective measures.
- A mathematical modelling study assessing the impact of public compliance on non-pharmaceutical interventions with a cost-effectiveness analysis to measure the effectiveness of curtailing the spread of the virus found that control involving both adherence and compliance to COVID-19 rules and sanitation prove to be the most cost-effective strategies.
- An evaluation of COVID-19 policies in 50 different countries and territories has been released. The analysis considers both pharmaceutical and non-pharmaceutical interventions and assesses a jurisdiction's success at containing COVID-19 both prior to and after vaccination. New Zealand was found to be one of the most successful due to early lockdowns and swift vaccination policies in response to the Delta variant. Singapore was also successful at containing the virus due to responding to what was initially rapid virus spread with increased health system policies, lockdown efficiency and vaccination. Taiwan was exemplary, managing to suppress cases after a surge during low vaccination coverage within 2-3 months. Overall, the study found rigorous policies and lockdowns, especially early in the pandemic, were key to top performing nations. Additionally, the ability to make lockdowns appropriate to the level of risk and flexible was key to avoiding damage to other areas of society.
- An observational study on the impact of contact tracing and testing on controlling COVID-19 without lockdown in Hong Kong found that i) restoring social distancing measures without maintaining tracing and testing efficiency was not enough to prevent growth of the outbreak; ii) a rise in number of daily cases increased the probability of confirmation delay among contact-traced cases; iii) testing at-risk groups reduced the probability and the duration of confirmation delay among contact-traced cases.
- 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. Further, because gathering size distributions are "heavy-tailed", a meaningful reduction in new cases only occurs once restrictions are set quite low (to achieve reduction in cases of 50% or more, restrictions must be set below 30 in most settings).
- Systematic review of economic evaluations of COVID-19 interventions

Health System Capacity

Omicron Dashboard

The Omicron dashboard (**Figure 27**) describes how the health system is being impacted by the Omicron outbreak, using data from many clinical and health sector indicators. The following page shows key indicators for the week ending 30 June 2022.

Figure 27: Omicron Health Sector Clinical Indicators Dashboard summary, week ending 30 June 2022

Sector	Summary of data
General Practice	National General Practice Encounter Date (GPQED) rates at 23 June 2022 were 6.1% higher than at the same time last year. This is slightly lower than the annual change measured at 19 June 2022. The Matariki public holiday has impacted the normal comparisons that are made with the GPQED data this week.
Flu Tracking	The percentage of FluTracking participants who reported fever and cough has steadily increased since mid-February, exceeding percentages observed in previous years for this time of year. While this may still be in part driven by the ongoing Omicron outbreak, there is also evidence of increasing non-COVID-19 ILI activity, particularly due to influenza, throughout New Zealand.
Aged Residential Care	There has been a reduction in the number of Aged Residential Care facilities with COVID-19 cases this week, from 146 facilities last week, to 138 (21% of all facilities). There is still considerable fluctuation in case numbers across the DHBs, although total case numbers have steadied between 455 and 492 in June.
Pacific Health	Pacific providers across the motu are working to provide both COVID-19 vaccinations and flu vaccinations. Providers are reporting increasing influenza cases particularly among Pacific children at schools.
Disability Services	The availability of a second COVID-19 booster vaccine is being promoted to immunocompromised disabled people and disability support workers. The Ministry continues to work with key stakeholders and communities within the disability system, across the wider Health sector and through interagency work, to ensure the Omicron response meets the needs of disabled people and continues to protect those at greater risk.
Emergency Ambulance Service	There is continued pressure on the ambulance sector with significant levels of demand continuing and sustained long incident cycle times. Delays at emergency departments are a contributor. Wellington Free Ambulance has escalated its internal Pandemic Escalation Plan to level toru (3) due to high volumes.
ED	Nationally emergency department attendance volumes for the week ended 26 June decreased 3.2% to 22,761. This is the lowest it has been since mid-May. Nationally, performance for SSED (patients admitted or discharged within 6 hours) remained static for all three measures, reporting 74% for all-patient SSED, 57% for admitted patients and 80% for non-admitted patients.
Hospital	Hospitals continue to experience high occupancy, however there has been a reduction in the % of time spent over 90% hospital occupancy across most of the major hospitals this week. Acute patients with a Length of Stay 7 days or over continue to remain elevated across the motu, despite a slight reduction this week.
Planned Care (Hospital)	There continues to be fluctutations in planned care across the motu. There are significant waiting lists for ultrasound in most areas, and MRI in others. Total waiting lists remain high, with demand outstripping capacity of workforce and equipment in all areas.
Pharmacy	COVID-19 related staff absence continues to impact on pharmacy opening hours (e.g., a pharmacy temporarily closed as both pharmacists have COVID-19 and no locum is available (Capital and Coast); pharmacies reducing weekend hours due to staff shortages (South Canterbury, MidCentral and Lakes).
Home and Community Services	We continue to see a reduction in total numbers of employees compared with October-December last year (10% decline) and a decline in total services delivered compared with October-December last year (5% decline).
Critical Care Workforce	Auckland City Hospital critical care workforce continues to be the most impacted by COVID-19 staff related absences. There were minimal staff absences reported in the other critical care units across the motu this week.
COVID care in the community	There has been 157,728 cases created in the NCTS during the four weeks to 25 June 2022. For the past week, prioritised cases interview completion rate was on average 2.5% higher than non-prioritised cases. The percentage of initial clinical assessments completed within 48 hours for Māori has increased throughout the past week with completions each day increasing from 71.3% to 81.1%.

Sources: Omicron Health Sector Clinical Indicators Dashboard, 30 June 2022

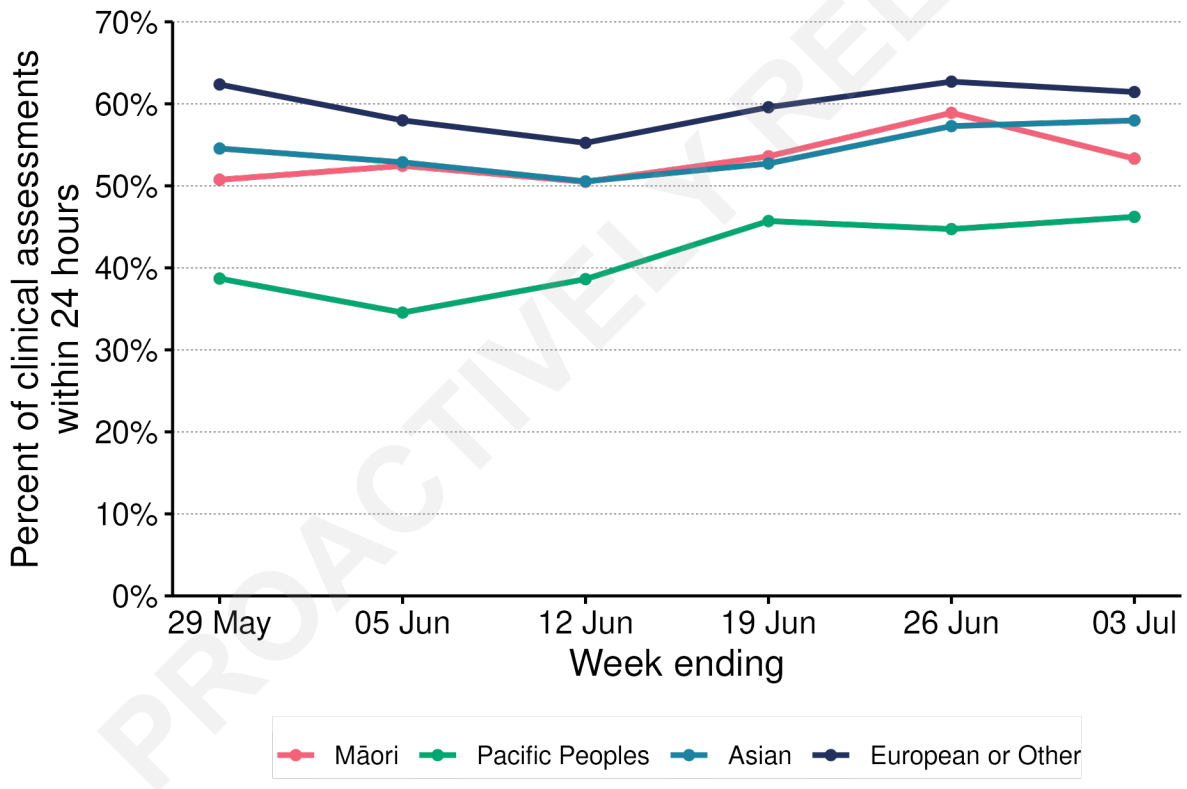
Care in the Community

The Ministry of Health and the Ministry of Social Development collaborated to develop COVID-19 Care the Community (CinC). 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 28 shows the percentage of clinical assessment completed within 24 hours by Ethnicity. In the week ending 03 July 53% of Māori, 46% of Pacific Peoples, 58% of Asians and 61% of European or others had clinical assessment completed within 24hrs. This trend has been similar for all ethnic groups for the past three weeks.

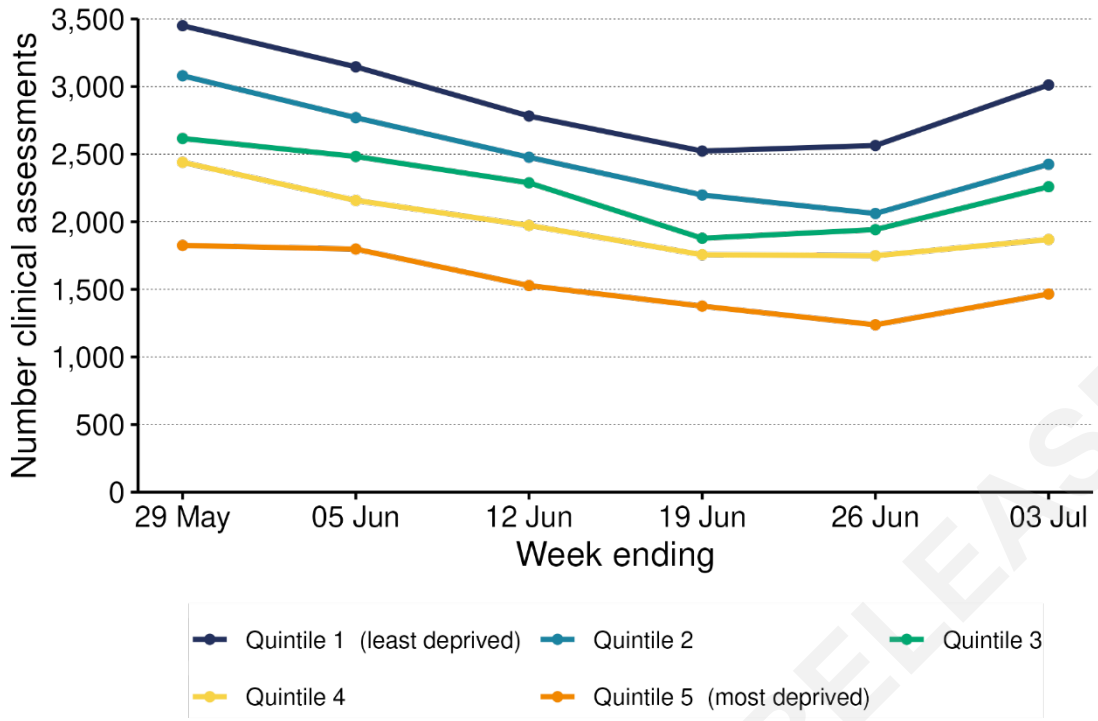
Figure 29 shows the number of clinical assessments by deprivation. Last week, people residing in the least deprived areas have a higher number of completed clinical assessments compared to those living in the most deprived areas, a difference of 1,546.

Figure 28: Percent of initial clinical assessment completed within 24 hours of positive case by ethnicity, 29 May – 03 July 2022



Sources: CCCM/QLIK, Socrates 03 July 2022

Figure 29: Number of clinical assessments by deprivation 29 May – 03 July 2022



Sources: NCTS, 03 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.