

Trends and Insights Report

Updated 17 June 2022

Please note that this report should only be distributed beyond the intended recipients on a need-to-know basis and is not for public consumption.

Purpose of report

This report focuses on a broad national and regional overview with key insights based on the quantitative trends in the New Zealand COVID-19 pandemic, including the trends and scale of infection and diagnosis as well as morbidity and mortality. In interpreting and using these data, readers need to be aware of surveillance data limitations.

Key insights from past 7 days

Infection Trends

- **Nationally, the weekly case rate was 8.3 per 1,000** population for the week ending 12 June. This rate has decreased from 9.3 per 1,000 population in the previous week.
- **For the week ending 15 May**, estimates suggest that **1.6% (495/30,668) of healthcare workers** and **1.1% (232/20,632) 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 (1.1% [11 per 1,000] versus 7.4 per 1,000**, respectively).
- Levels of viral RNA in **wastewater have decreased in all regions**, however, **the decreases are not as substantial** as seen in the overall case rates.
- Contradictory to other evidence, **this could indicate there was no substantial decrease in the underlying level of new infections for the past 2 months**.
- In the past week, **four out of 19 DHBs experienced an increase in case rates**, 3 in the Central region and 1 in Te Manawa Taki. There was a 13% increase in Hutt Valley, 1% in MidCentral, 7% in Whanganui and 7% in Bay of Plenty.

Demographic Trends in Case Rates

- The **lowest case rates** are in **Pacific Peoples (4.2 per 1,000)**; case rates in this group have decreased by **14% in the past week**. **Māori case rates have also declined** and are now at **5.2 per 1,000**.
- **For the 65+ age group**, case rates in the Northern region decreased by 26.3%, Te Manawa Taki decreased by 14.6%, Central increased by 2.4% and Southern decreased by 8.3% 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 10.6 per 1,000 and 65+ at 7.8 per 1,000). **Cases rates for all ethnicities aged 65+ have been stable in the past month, but have decreased slightly in the past week**.

Whole Genome Sequencing

- **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 in a number of sites.**
- 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 98% of sequenced community cases** in the past two weeks.
- As of 13 June, ESR had received samples from 96 of the 296 PCR positive hospital cases with a report date in the two weeks to 10 June 2022. Of these, **86% had a BA.2 genome**, 3% were BA.1, 10% failed WGS and 1% were BA.2.12.1.

Border Surveillance

- In the week ending 29 May, there were 38,058 border arrivals, of which **89.6% (34,114) uploaded a RAT result upon arrival**. This is slightly lower than the 90.7% from the week prior.
- In the week ending 22 May, **about 2-3% of arrivals tested positive** (via RAT). Both the number and rate of active cases are falling, even while total arrivals are increasing.
- In the week ending 05 June, the percentage of PCR positive border arrivals with WGS complete was 52.2%. However, please note that WGS can be incomplete for recent cases. This percentage was **60.8% for the week ending 29 May** and **58.2% for the week ending 22 May**.

Hospitalisation and Mortality

- For the week ending 05 June, the national hospital occupancy rate was 7.4 per 100,000 population, **a decrease of 6% in the past week**. Hospital occupancy rates have continued to vary across regions in the past week. Central region (7.3 per 100,000) decreased by 6% and Southern (7.9 per 100,000) decreased by 23%, while the Northern region (7.9 per 100,000) decreased by 1% and **Te Manawa Taki (5.7 per 100,000) increased by 12%** in the past week.
- As of 15 June 2022, **1,374 people have died** with or after COVID-19 infection. Of these, **1,308 have died within 28 days** of being reported as a case.
- Of the deaths that have been reviewed, **51% had COVID-19 as the main underlying cause**, and **COVID-19 contributed to 28%** of deaths. The remaining **20% were found to be due to unrelated causes**, such as accidents.

International and Scientific Insights

- **Globally, the number of new weekly cases has continued to decline** since a peak in January 2022. In the week ending 12 June 2022, over 3.2 million cases were reported, similar to the 3.3 million reported the previous week. **The number of new weekly deaths has risen after 5 weeks of decline**, with over 8,700 fatalities reported, a 4% increase compared to the previous week.
- The scientific insights section includes studies on outbreak management, economic evaluations, transmission dynamics and modelling studies.

Health System Capacity

- For the week ending 02 June, **19% of the 656 Aged Residential Care (ARC) facilities have at least one active COVID-19 case** (127 of 656 facilities).

- **ED attendance for the week ending 02 June is among the highest since reporting commenced.** Number of ED presentations shows the same pattern as number of admitted patients.

PROACTIVELY RELEASED

Domestic epidemic outlook

Infection outlook

- Since the March peak, case rates were declining leading up to the week of 17 April, after which cases overall have continued to decline, but at a slower pace.
- The overall national picture shows a continued decrease in cases after the plateau observed from late April to late May; driven by decrease in Northern and Te Manawa Taki regions. However, cases in Central region have increased by 6% in the previous week compared to all other regions and cases in Southern are still 29% higher than overall national case rates.
- Infection levels are likely to be higher than the self-reported cases indicate as wastewater RNA has not decreased substantially since early April, despite an overall substantial decrease in case rates since the March peak.
- Fatigue from following public health orders, misconception about level of infection risk and infection trends from reported cases could be impacting infection prevention and control behaviours and adherence to public health measures, which may be increasing risk of infection, especially among vulnerable populations.
- The combined effects of the reduction in mandated public health measures e.g. mask wearing in some settings with the move to Orange and the return of schools from term break on 04 May could have contributed to the initial increases in 5-14 years olds in early May, however, rates in this age group have been decreasing for the past 3 weeks.
- While in all other age groups there has been steady decline, overall cases have not decreased in the past 4 weeks among those aged 65+. This is could be due to infections moving from younger age groups to older age groups over time, with people aged 65+ having previously much lower rates than younger age groups
- There continues to be detection of **BA.4, BA.5 and BA.2.12.1 in the community both in wastewater and in community WGS**. Current levels are likely to increase in the coming months.

Tertiary Care outlook

- There is substantial risk for the 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 residing in aged residential care, with co-morbidities or in conditions of high deprivation.

Contents

Infection Trends	7
Summary of evidence for infection and case ascertainment trends	7
Approximation of underlying infection incidence	7
Test positivity trends in Northern region hospital admissions.....	9
Wastewater quantification	10
Trends in diagnosed cases	11
Modelled and actual cases.....	13
Effective reproduction rate, and forecasts of cases and infections	14

Demographic trends in case rates.....	16
Ethnicity trends over time and by region.....	16
Age trends over time and by region.....	19
Deprivation trends over time, by ethnicity and by region.....	21
Vaccination trends over time.....	23
PCR and RAT testing trends.....	24
Whole Genomic Sequencing of Community cases.....	24
Border Surveillance.....	26
Cases detected at the Air Border.....	26
Testing of Border arrivals.....	27
Whole Genomic Sequencing of Imported cases.....	28
Hospitalisation and Mortality.....	31
Hospitalisation Rates.....	31
Hospital Occupancy.....	31
Whole Genomic Sequencing of hospitalised cases.....	32
Modelled and actual hospital occupancy rate.....	32
Mortality.....	33
All cause death rates.....	35
International and Scientific Insights.....	36
Overseas waves and the likely impacts of new variants, policy changes and waning immunity.....	36
Primary evidence on effectiveness of infection prevention and control measures.....	38
Evidence brief on Masking mandates.....	39
Health System Capacity.....	42
Omicron Dashboard.....	42
Care in the Community.....	44
Data Sources.....	46

Figures

Figure 1: Regional weekly case rates of health care workers for weeks 08 May – 12 June 2022.....	8
Figure 2: Regional weekly case rates of border workers for weeks 08 May – 12 June 2022.....	8
Figure 3: Percent of tests positive among Northern region hospital admissions.....	9
Figure 4: Regional wastewater trends in SARS-CoV-2 genome quantification for weeks 06 February – 12 June 2022.....	10
Figure 5: Regional weekly case rates for weeks 08 May – 12 June 2022.....	12

Figure 6: COVID Modelling Aotearoa scenarios compared with reported cases nationally	13
Figure 7: Projected national cases by (A) date of report and (B) date of infection	15
Figure 8: National weekly case rates by ethnicity for weeks 08 May – 12 June 2022	17
Figure 9: National ethnicity-specific weekly case rates by age group for weeks 08 May – 12 June 2022	17
Figure 10: Regional weekly case rates by ethnicity for weeks 08 May – 12 June 2022.....	18
Figure 11: National weekly case rates by age for weeks 08 May – 12 June 2022	20
Figure 12: National weekly COVID-19 case rates by deprivation status for weeks 08 May – 12 June 2022.....	22
Figure 13: National weekly case numbers by vaccination status for weeks 08 May – 12 June 2022	23
Figure 14: Frequency of Variants of Concern in community cases in New Zealand.....	25
Figure 15: Cases reported in post-arrival testing by country of flight departure, 01 January – 14 June 2022	26
Figure 16: Percentage of positive tests from border arrivals who complete RAT tests, 28 February – 05 June 2022	27
Figure 17: Completion metrics for border returnee testing and WGS for arrivals, 28 February – 05 June 2022	29
Figure 18: Border returnee testing and WGS metrics for arrivals, 28 February – 05 June 2022	30
Figure 19: Regional weekly hospital occupancy rate per 100,000 population, 08 May – 12 June 2022	31
Figure 20: CMA hospital occupancy scenarios compared to actual hospital occupancy.....	32
Figure 21: 7-day rolling average of deaths within 28 days of COVID-19, by date of death, 12 March – 12 June 2022	33
Figure 22: Deaths by cause, 01 January – 14 June 2022	34
Figure 23: Rates of all deaths with or after COVID-19 infection per 1000 population, by Age and Ethnicity, 01 March – 12 June 2022	35
Figure 24: COVID-19 case rates in school aged children and adults aged 18-44.....	40
Figure 25: The rate of infection in teachers compared to all of NZ. cases per 100 per day, week.....	41
Figure 26: Omicron Health Sector Clinical Indicators Dashboard summary, week ending 09 June 2022	43
Figure 27: Percent of initial clinical assessment completed within 24 hours of positive case by ethnicity	44
Figure 28: Number of clinical assessments by deprivation	45

Infection Trends

Summary of evidence for infection and case ascertainment trends

Currently, **the national border workforce case rates in the past week (11.2 per 1,000) were higher than the general population (8.3 per 1,000)**; these rates were similar when comparing border workforce rates in the Northern region among 25-44 year-olds at 10.2 per 1000 (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 continued decreasing in all regions, except Central**. This decrease is consistent at a national level across all ethnicities and age groups.

Levels of viral RNA in **wastewater continued to decrease in Auckland metro and all other regions except Northern region**; however, **levels in all regions remain above those seen in mid-February**. Contradictory to other evidence, the overall relatively small decrease (when compared with reported cases) **could indicate there was no substantial decrease in any region in the underlying level of new infections for the past 2 months**.

Case rates are tracking closely to 'C', the worst-case scenario which assumes an increase in transmission as people return towards pre-COVID levels of social and work mixing after the initial Omicron peak. The **effective R remains at 1.0** (90% Credible Interval [CI]: 0.9-1.1) for cases to 11 June, suggesting that cases are likely to remain at current levels for the next week.

Approximation of underlying infection incidence

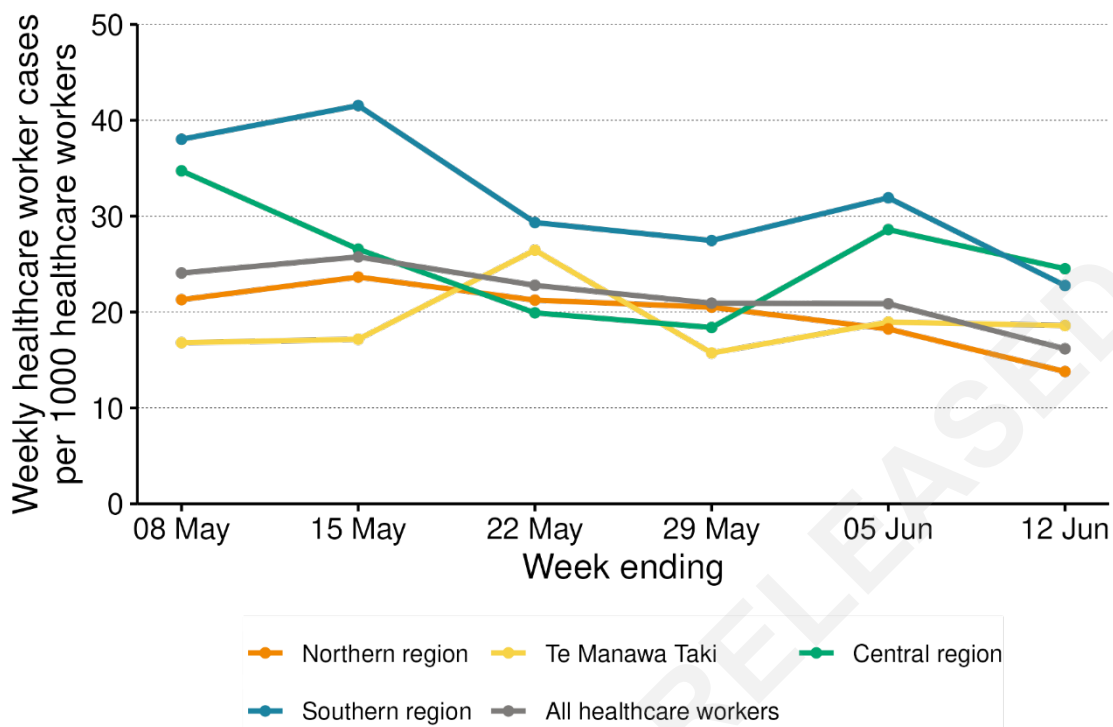
Underlying infection incidence has been estimated using case rates for routinely tested healthcare workers and border workers where there was evidence of regular testing.¹ While these workforces are not a representative sample of New Zealanders, **the border workers are now likely to have a similar risk 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 05 June, estimates suggest that 1.6% (495/30,668) of healthcare workers (**Figure 1**) and 1.1% (232/20,632) of border workers² (**Figure 2**) have tested positive (for the first time). The border workforce is concentrated in the Northern region (56% of the total workforce) in the 25-to-44-year age group; the rate for Northern border workers in this age group was 1.0%.

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.

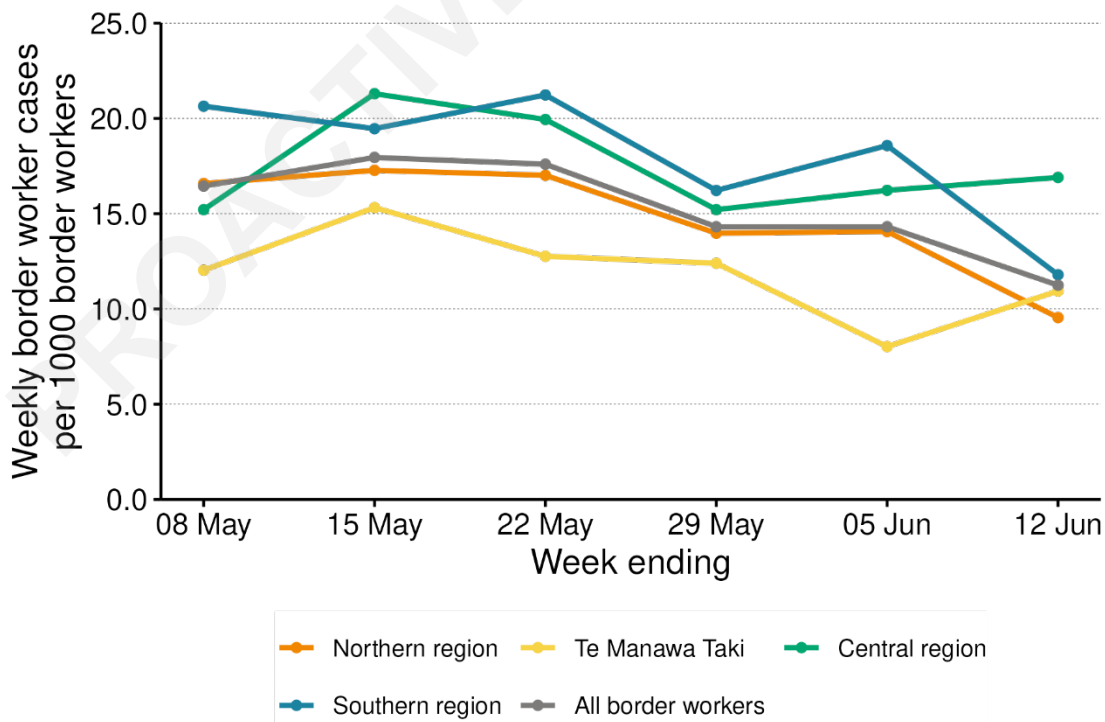
² This rate may be underestimated as not all border workers are rostered on and therefore not required to undertake testing.

Figure 1: Regional weekly case rates of health care workers for weeks 08 May – 12 June 2022



Source: Éclair/Episurv, 2359hrs 12 June 2022

Figure 2: Regional weekly case rates of border workers for weeks 08 May – 12 June 2022

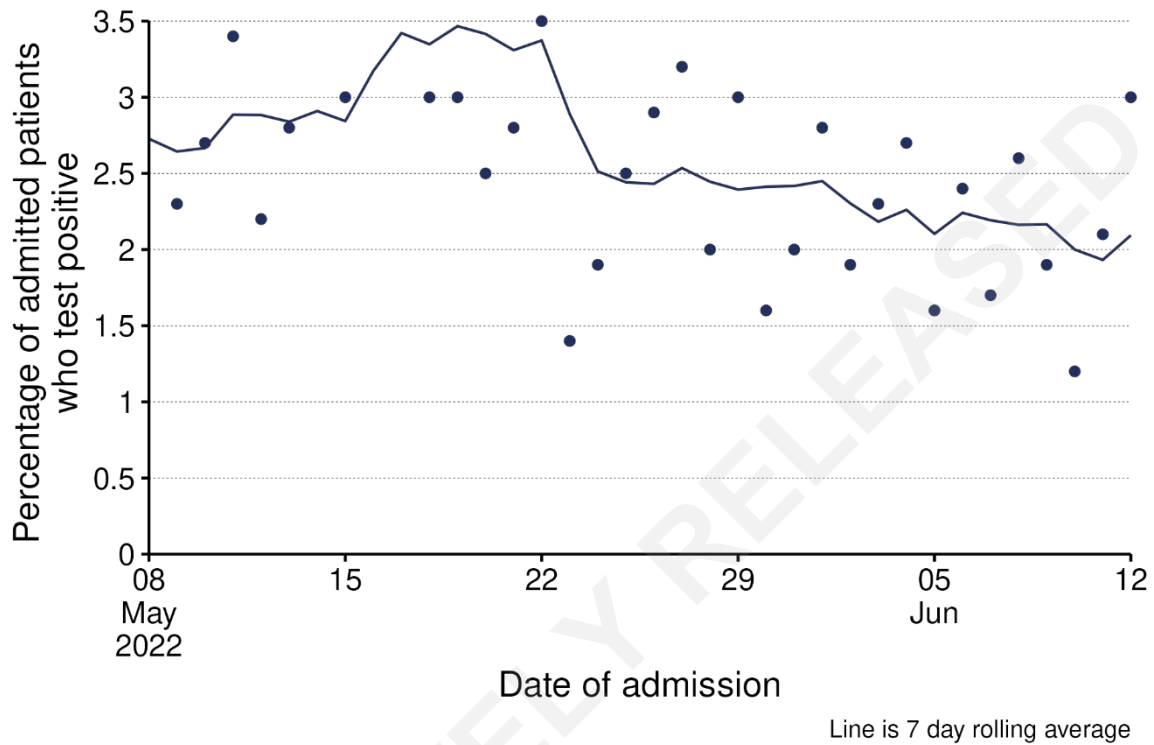


Source: Éclair/Episurv, 2359hrs 12 June 2022

Test positivity trends in Northern region hospital admissions

The Northern region inpatient positivity is shown in **Figure 3**. Since **peaking at ~15% in early March**, the Northern region hospital admissions **positivity has declined** with a 7-day rolling average of 2.1% (160/7643) in the week ending 12 June.

Figure 3: Percent of tests positive among Northern region hospital admissions



Source: Northern Region hospitalisation data, NCTS & EpiSurv as at 2359hrs 12 June 2022

Wastewater quantification

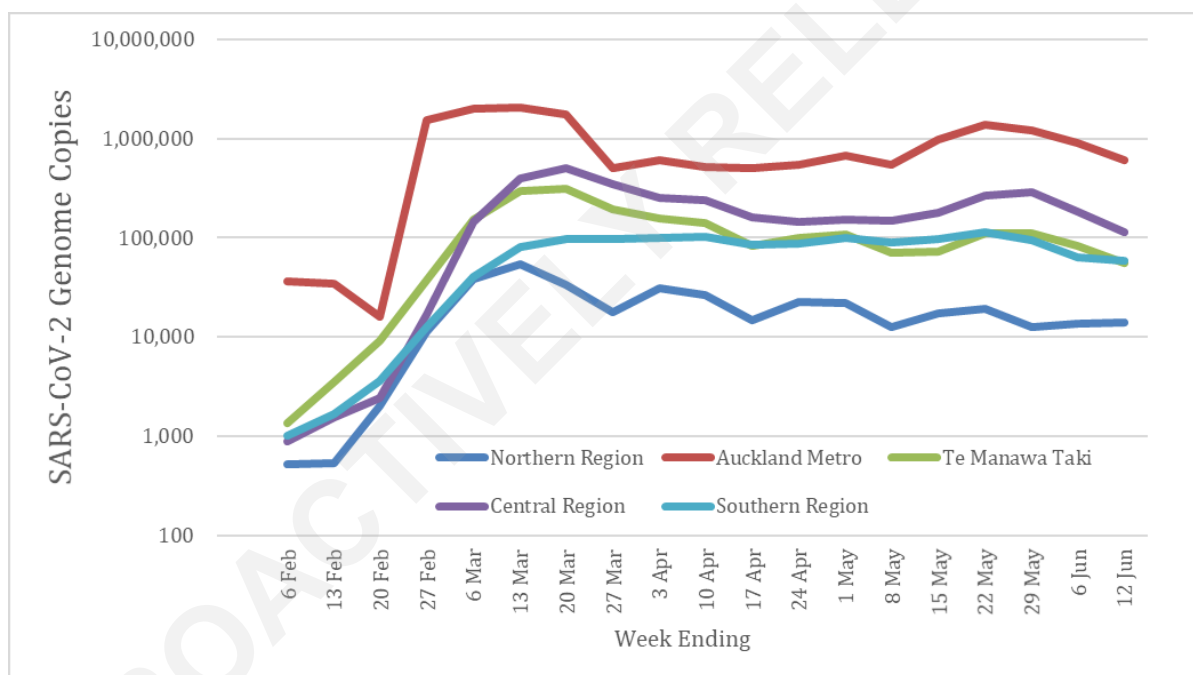
Figure 4 provides an overview of wastewater results by region. Please note that it is not appropriate to compare SARS-CoV-2 absolute levels by region; this figure can only be used to assess the trends *within* each region.

The SARS-CoV-2 RNA levels in wastewater in the Northern region (excluding Auckland Metro) have had small variations since peaking in mid-March, but overall have followed a slight downward trend. Auckland Metro rates peaked in mid-May and have since decreased slightly since to the week ending June 12.

Te Manawa Taki and Central regions have decreased in the past two weeks. Southern region wastewater trends have been stable for the past two months but have also decreased in the past few weeks.

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 for weeks 06 February – 12 June 2022



Source: ESR SARS-CoV-2 in Wastewater update for week ending 12 June 2022

Trends in diagnosed cases

Overall, **the weekly case rate was 8.3 per 1,000** population for the week ending 12 June. This is a **decrease from the previous week**, which was 9.3 per 1,000.

Figure 5 shows that case rates have decreased across all regions except Central in the past week. Northern region (6.8 per 1,000) and Te Manawa Taki (6.6 per 1,000) decreased by 19% and 10% respectively. Southern region (10.7 per 1,000) decreased by 14% while Central region (10.5 per 1,000) increased by 2%.

Case rates in Central and Southern regions have converged this week (above the national average case rate), as have Northern and Te Manawa Taki (below the national average case rate).

In the past week, **four out of 19 DHBs experienced an increase in case rates**. These were mostly DHBs in the Central region, except for Bay of Plenty DHB. There was a 7% increase in Bay of Plenty, a 13% increase in Hutt Valley, a 1% increase in MidCentral and a 7% increase in Whanganui.

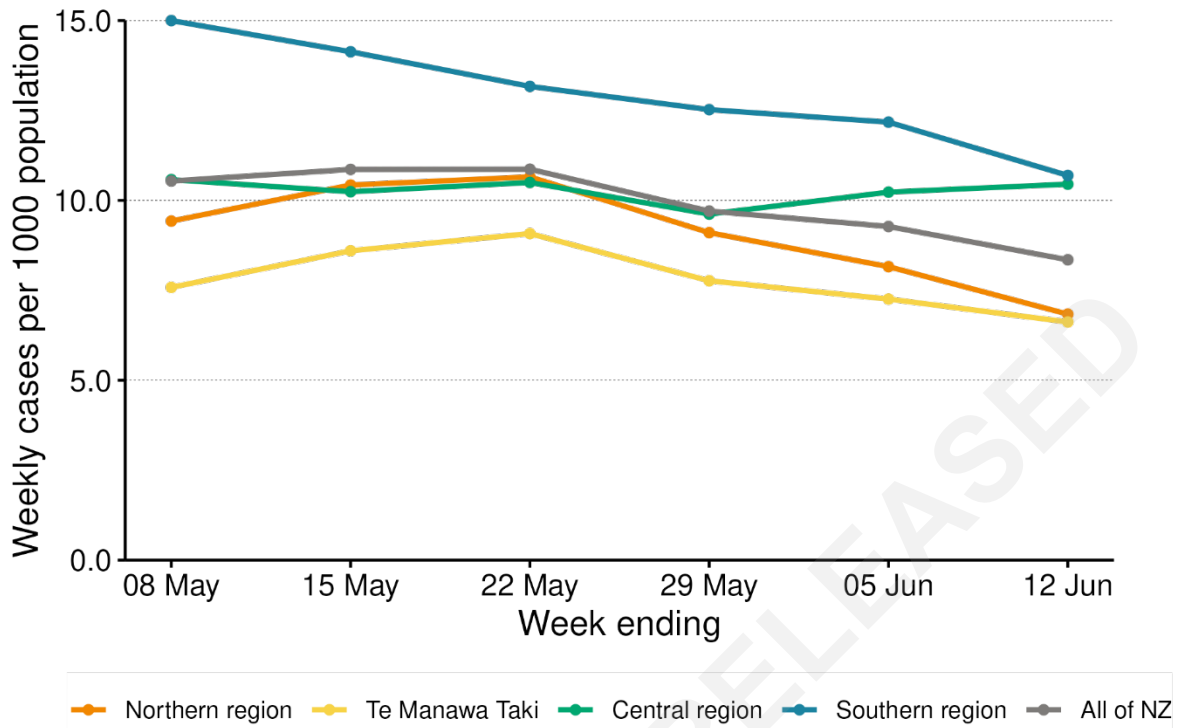
In the Northern region, the weekly case rate was highest for **Waitematā (8.3 per 1,000)** followed by Auckland DHB (7.4 per 1,000).

In Te Manawa Taki, weekly case rates were highest in **Taranaki (9.6 per 1,000)**, followed by Waikato DHB (7.0 per 1,000). Other DHBs in Te Manawa Taki had weekly case rates below 6 per 1,000.

The highest weekly case rates in the Central region were in **Capital and Coast (12.9 per 1,000)** followed by Hutt Valley (12.1 per 1,000). Other DHBs in the Central region had weekly case rates between 7 and 10 per 1,000.

In the Southern region, the highest case rates were in **West Coast (13.7 per 1,000)** followed by Canterbury DHB (11.2 per 1,000).

Figure 5: Regional weekly case rates for weeks 08 May – 12 June 2022



Source: NCTS/EpiSurv as at 2359hrs 12 June 2022

Modelled and actual cases

COVID-19 Modelling Aotearoa (CMA) have published three “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 6**). 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.

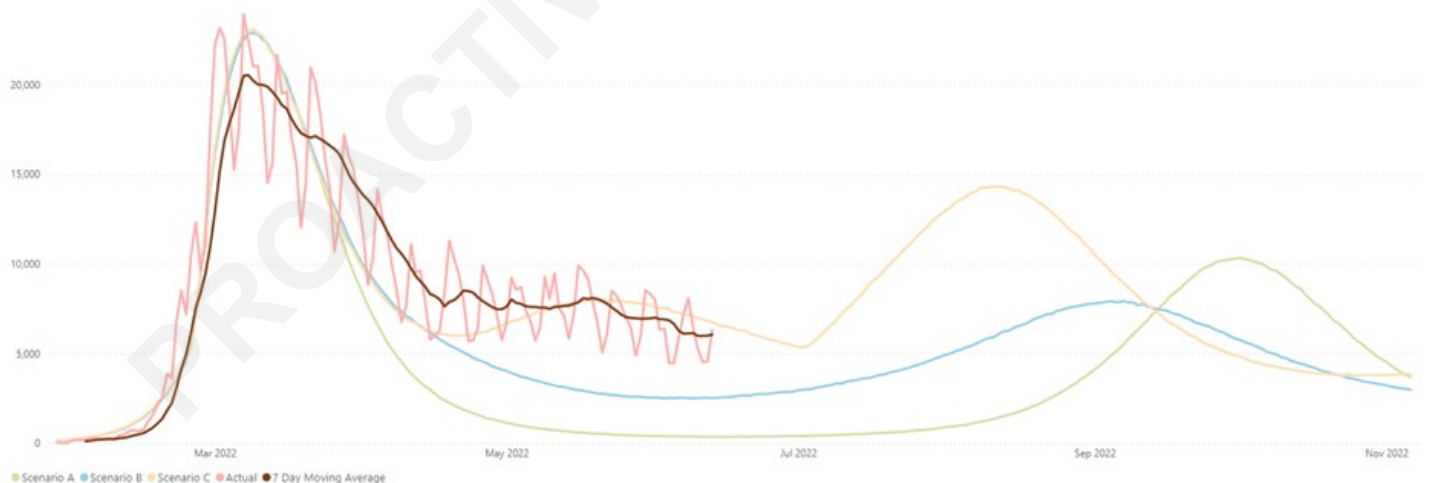
All three scenarios feature waning immunity after vaccination and/or infection, which leads to a “winter wave” beginning as early as July (Scenario C).

The size and timing of a second wave will be affected by any changes in modifiable exposure risk factors such as gathering size limits, masking, contact tracing, testing and isolation along with pharmaceutical interventions such as boosters and anti-virals. The very high hospital occupancy in Scenario C shows how sensitive the models are to an increase in infections in older and more at-risk populations.

These scenarios are based on the current Omicron BA.2 variant. Any significant changes in the virus could cause drastically different case numbers. Scenarios for BA.4 and BA.5 are similar to the increase in transmission in the existing Scenario C. Scenarios for possible future Variants of Concern (VoC) have been included in the VoC Strategy workstream.

Currently, cases are tracking closely to ‘C’, the scenario with the largest increase in transmission after the March peak.

Figure 6: COVID Modelling Aotearoa scenarios compared with reported cases nationally



Sources: COVID-19 Modelling Aotearoa Branching Process Model April 2022, and Ministry of Health reported case data 13 June 2022

Effective reproduction rate, and forecasts of cases and infections

These estimates used the *EpiNow* package² on 15 June using data to 11 June.³ The median estimate of **effective R (R_{eff}) nationally is 1.0** (90% Credible Interval [CI]: 0.9-1.1) for cases to 11 June, after adjusting for data lags; this is **the same as the previous week**. The confidence interval indicates a low to moderate level of uncertainty for this estimate.

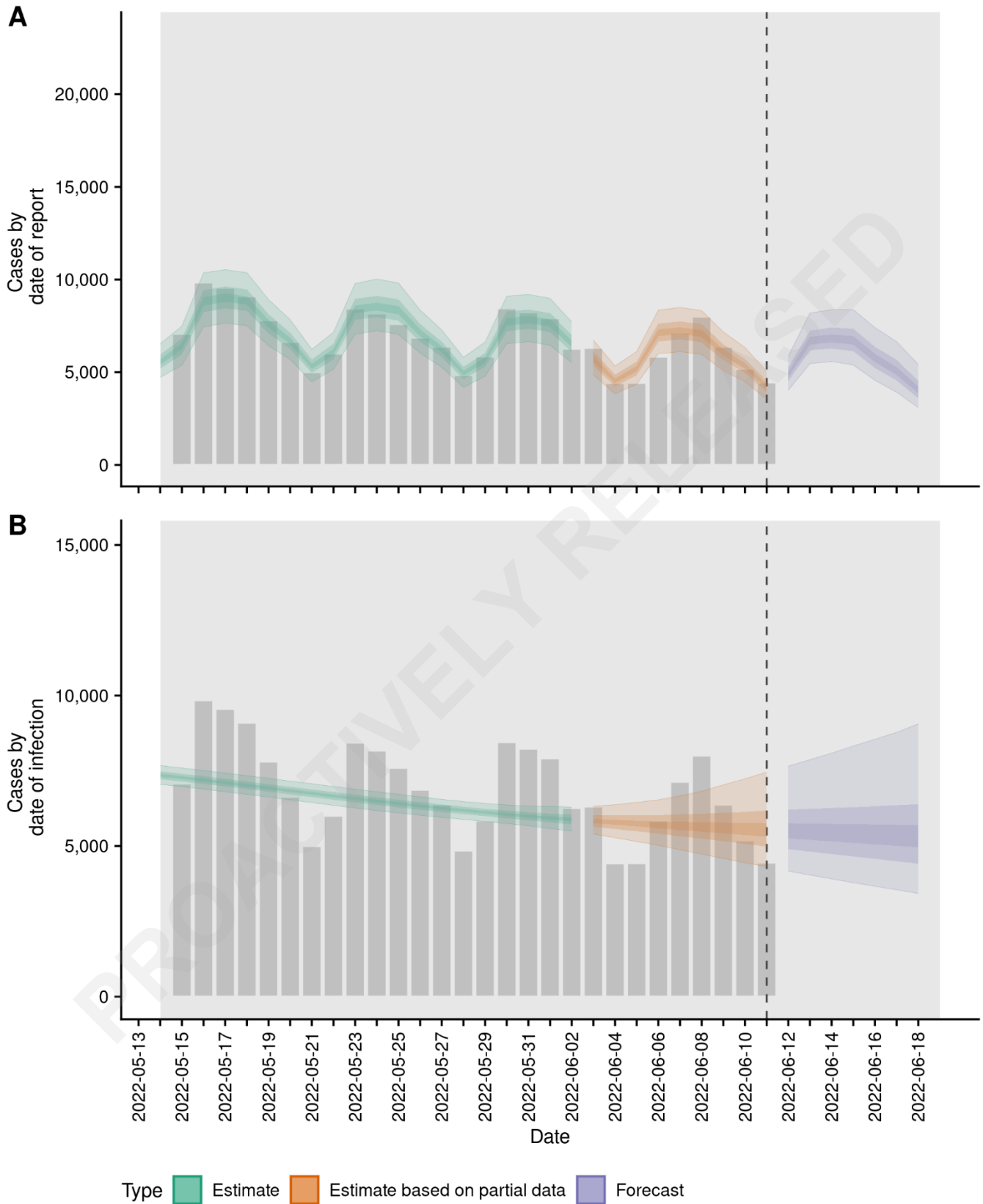
Figure 7 compares the previous week's model median estimate for 11 June 2022 of 4,306 cases per day with a 50% credible interval of 3,883 – 4,789 to the actual reported cases of 4,244. This estimate was very close to the actual number—only a 1% overestimate and well within the 50% credible interval.

For all Public Health Units (PHUs), the model is estimating a **median R_{eff} of 0.9, 1.0 or 1.1**.

The model's median estimate is that national reported cases could be 4,051 cases per day by 18 June (50% credible interval: 3,611 - 4,525). However, the credible intervals for the projected cases would be even wider if the possibility of continuing trend changes in effective R were included.

³ The *EpiNow* package 'now-casts' and forecasts cases to measure current, past and future transmission nationally by calculating and then extrapolating the effective reproduction number, 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 7: Projected national cases by (A) date of report and (B) date of infection



Source: EpiNow 11 June 2022, based on NCTS and EpiSurv cases

Demographic trends in case rates

Ethnicity trends over time and by region

Figure 8 shows national case rates by ethnicity. **Figure 10** shows regional case rates by ethnicity.

In the past week, **case rates declined 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 9.6 per 1,000 down from last week's 10.8 per 1,000**. The **lowest case rates continue to be in Pacific Peoples (4.2 per 1,000)**, which is a 14% decrease from last week (4.8 per 1,000). Māori have decreased by 12%, from 5.8 per 1,000 in the previous week to 5.2 per 1,000.

Case rates in the Northern region for European or Other were 8.3 per 1,000 and rates for Asian were 7.1 per 1,000. Māori had the second lowest case rate at 4.2 per 1,000. Pacific Peoples (3.4 per 1,000) continued to have the lowest case rates in this region.

Case rates for Te Manawa Taki were highest for Asian (8.2 per 1,000), comparable to European or Other (7.6 per 1,000). Pacific Peoples had the second lowest case rate at 4.7 per 1,000 and Māori (4.1 per 1,000) continued to have the lowest case rates in this region.

The overall increase in Central region case rates is largely being driven by increases in the Asian and Pacific Peoples groups. The rate for Asian (11.9 per 1,000) has increased by 22% compared to the previous week and the rate for Pacific Peoples (6.6 per 1,000) has increased by 11%. Central region rates for European or Other (11.6 per 1,000), have decreased very slightly from last week's 11.7 per 1,000, and Māori case rates have decreased slightly from 6.5 per 1,000 in the previous week to 6.3 per 1,000.

In the Southern region, case rates were highest for European or Other (11.1 per 1,000) and Asian (10.5 per 1,000). Pacific Peoples continue to have the lowest case rate at 6.3 per 1,000. Māori have the next lowest case rate at 8.1 per 1,000.

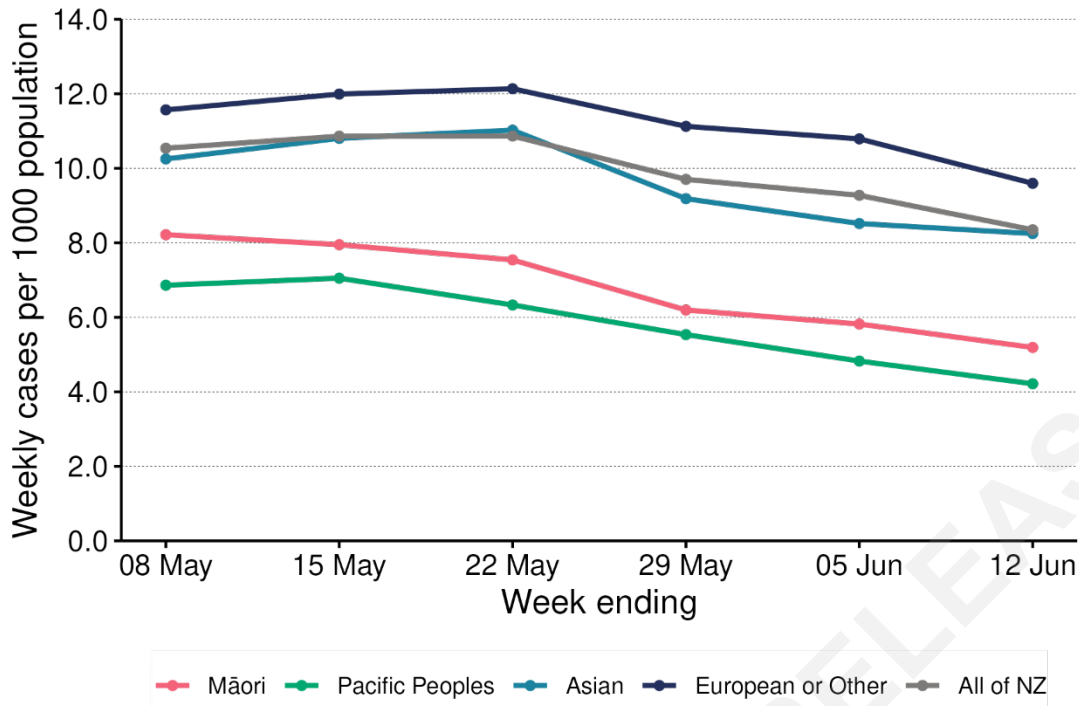
Figure 9 shows national case rates by ethnicity and further breakdown by age group. The **highest case rates** out of any cohort were **within those aged 25-44 of European or Other ethnicity (11.2 per 1,000)** whilst the lowest case rates were in those aged 0-4 of Pacific Peoples ethnicity (2.1 per 1,000). For both Māori and Pacific Peoples, case rates are highest in the 25-44, 45-64 and 65+ age groups. For Asian people, case rates are highest in the 15-24 and 25-44 age groups. For European or Other, case rates are highest in the 25-44 and 45-64 age groups.

Cases rates for all ethnicities aged 65+ have been quite stable in the past month, **but have decreased slightly** in the past week. Case rates for Asians aged 65+ were 4.9 per 1,000 in the week ending 12 June. Case rates for European or Other aged 65+ were 7.8 per 1,000 in the week ending 12 June. Case rates in Pacific People aged 65+ were 4.9 per 1,000 in the week ending 12 June. Case rates in Māori aged 65+ were 5.7 per 1,000.

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 10.6 per 1,000 and 65+ at 7.8 per 1,000).

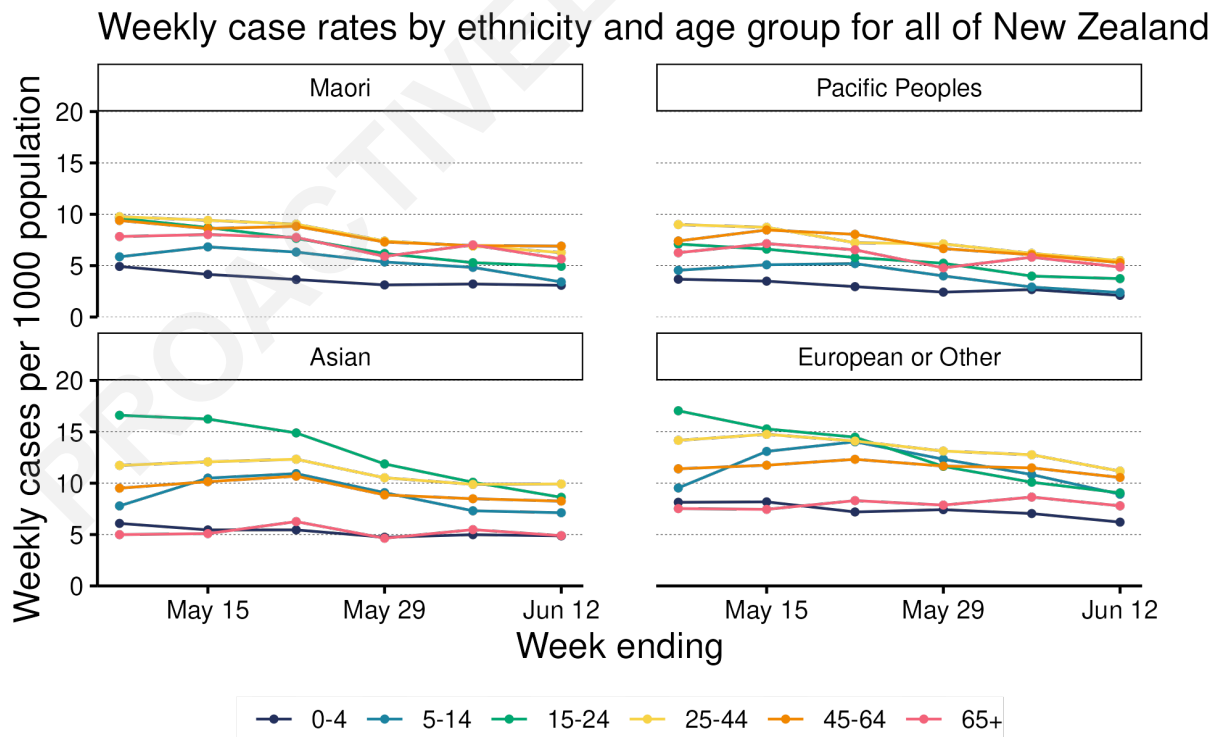
As Māori and Pacific Peoples have lower life expectancies than other ethnicities in Aotearoa New Zealand, they are likely to have a higher risk for COVID-19 complications at a younger age than other ethnicities.

Figure 8: National weekly case rates by ethnicity for weeks 08 May – 12 June 2022



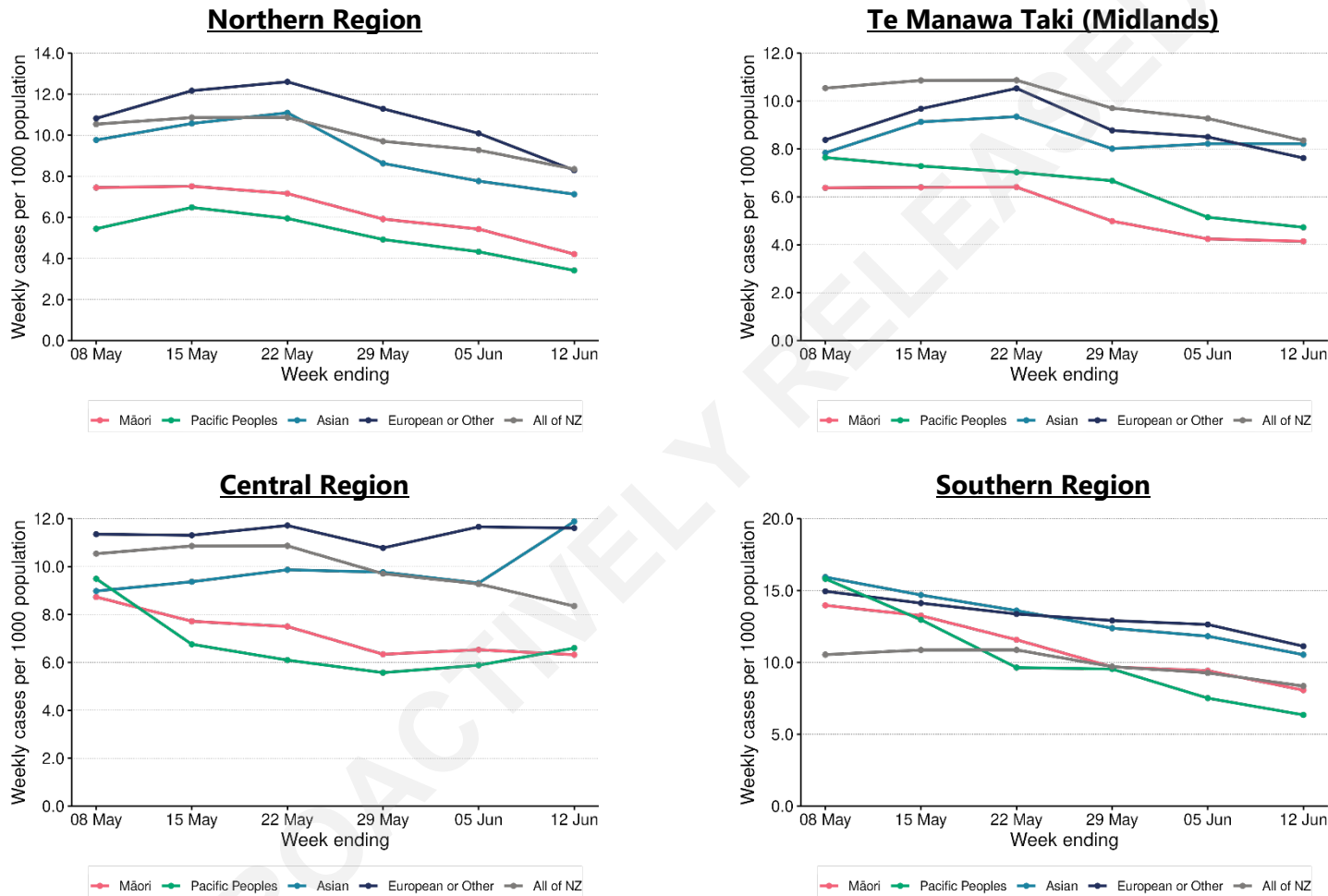
Source: NCTS/EpiSurv as at 2359hrs 12 June 2022

Figure 9: National ethnicity-specific weekly case rates by age group for weeks 08 May – 12 June 2022



Source: NCTS/EpiSurv as at 2359hrs 12 June 2022

Figure 10: Regional weekly case rates by ethnicity for weeks 08 May – 12 June 2022



Source: NCTS/EpiSurv as at 2359hrs 12 June 2022

Age trends over time and by region

Figure 11 shows community cases by age nationally. Case rates in all age groups have decreased in the past week.

Nationally, **case rates were relatively similar for 5-14, 15-24 and 65+ age groups (6.7, 7.6 and 7.4 per 1,000 respectively)** in the past week. Those aged 0-4 continued to have the lowest weekly case rate at 4.8 per 1,000. The 25-44 and 45-64 age groups had the highest case rates at 9.8 per 1,000 and 9.6 per 1,000 respectively in the past week.

For the 0-4 age group, case rates in the Northern region decreased by 8.5%, Te Manawa Taki decreased by 12.0%, Central decreased by 1.3% and Southern decreased by 18.3% in the past week.

For the 5-14 age group, case rates in the Northern region decreased by 25.4%, Te Manawa Taki decreased by 18.4%, Central decreased by 7.9% and Southern decreased by 30.0% in the past week.

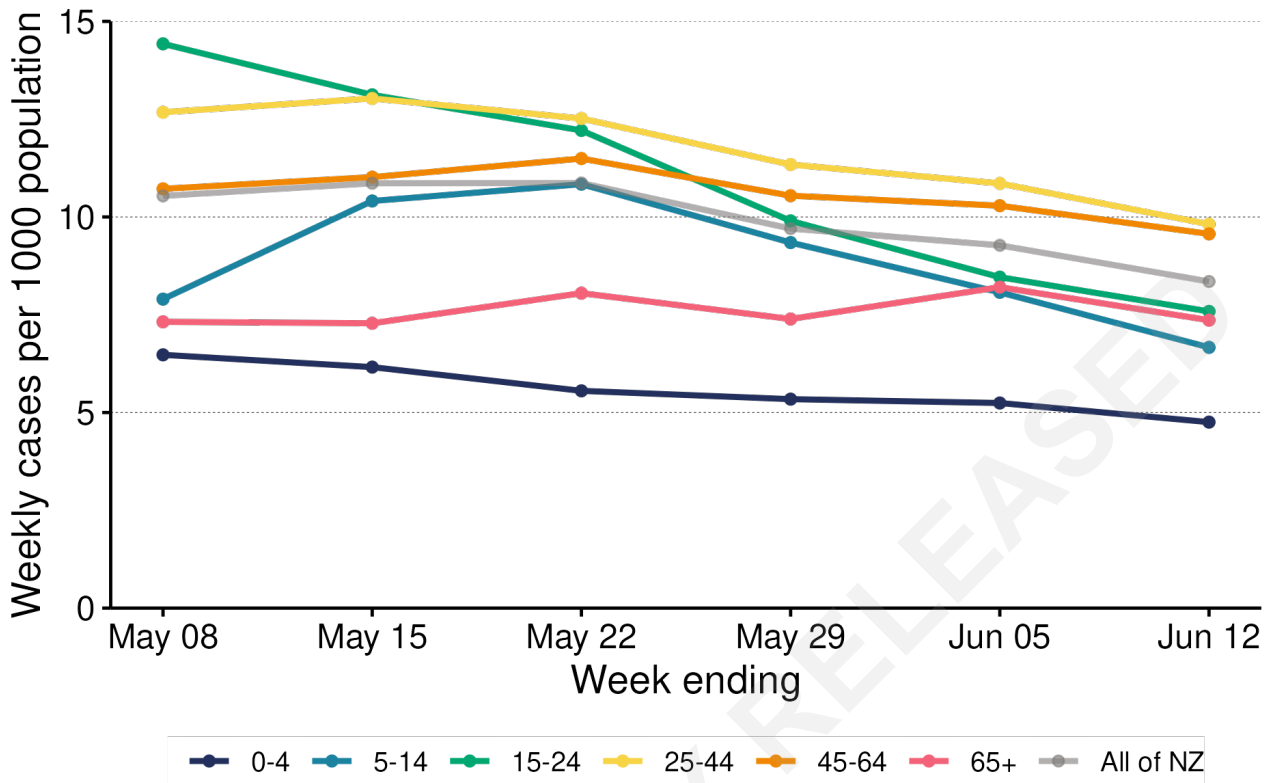
For the 15-24 age group, case rates in the Northern region decreased by 12.0%, Te Manawa Taki decreased by 8.3%, Central decreased by 9.7% and Southern decreased by 15.3% in the past week.

For the 25-44 age group, case rates in the Northern region decreased by 20.1%, Te Manawa Taki decreased by 4.7%, Central increased by 0.5% and Southern decreased by 11.4% in the past week.

For the 45-64 age group, case rates in the Northern region decreased by 18.1%, Te Manawa Taki decreased by 6.2%, Central increased by 11.9% and Southern decreased by 12.3% in the past week.

For the 65+ age group, case rates in the Northern region decreased by 26.3%, Te Manawa Taki decreased by 14.6%, Central increased by 2.4% and Southern decreased by 8.3% in the past week.

Figure 11: National weekly case rates by age for weeks 08 May – 12 June 2022



Source: NCTS/EpiSurv as at 2359hrs 12 June 2022

Deprivation trends over time, by ethnicity and by region

Figure 12 shows case rates based on the NZDep2018.⁴ Deprivation is a structural determinant of COVID-19 both in terms of risk and protection. 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 continue to be highest in the areas of least deprivation (10.3 per 1,000 population)**, followed by areas of mid-range deprivation (8.8 per 1,000) and areas most deprived (6.2 per 1,000).

Access to RATs and to an internet connection to report RAT results is likely associated with lower levels of 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 followed by Asian ethnicity (8.2 and 7.9 per 1,000 respectively). Cases in Pacific Peoples were the lowest in areas most deprived (3.1 per 1,000). Cases in Māori were the lowest in areas least deprived (8.1 per 1,000). European or Other had the highest case rates in areas least deprived at 10.8 per 1,000 followed by Asian (8.7 per 1,000).

For the most deprived areas, cases in Māori made up 18% of cases. The proportion of cases in the most deprived areas for Pacific Peoples was 8%, for Asian 17% and for European and Other, 57%. Following this, 80% of cases in areas of least deprivation were European and Other compared with 12% Asian, 5% Māori and 2% Pacific Peoples.

In the Northern region, case rates were highest in the least deprived areas (8.5 per 1,000 population) followed by areas of mid-range deprivation (7.5 per 1,000) and areas most deprived (4.6 per 1,000).

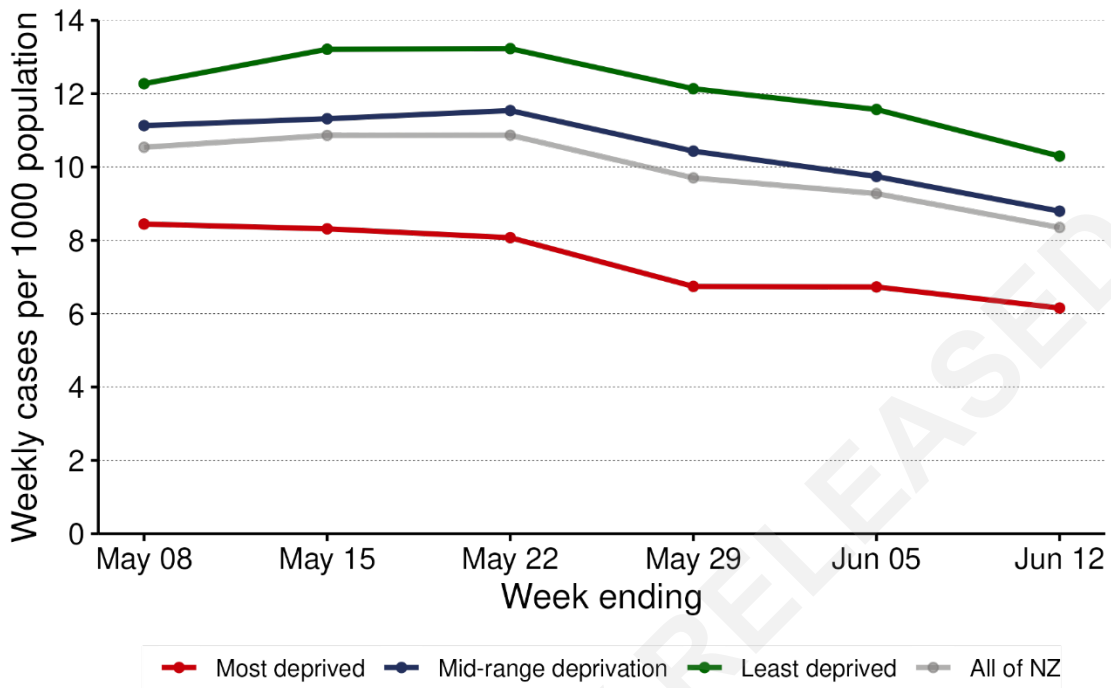
In Te Manawa Taki region, case rates were highest in the least deprived areas (8.4 per 1,000) followed by areas of mid-range deprivation (7.3 per 1,000) and areas most deprived (5.3 per 1,000).

In the Central region, case rates were highest in the least deprived areas (12.8 per 1,000) followed by areas of mid-range deprivation (11.2 per 1,000) and areas most deprived (7.4 per 1,000).

In the Southern region, case rates were highest in the least deprived areas (12.0 per 1,000) followed by areas of mid-range deprivation (10.4 per 1,000) and areas most deprived (9.7 per 1,000).

⁴ [Contents \(otago.ac.nz\)](https://www.otago.ac.nz/contents)

Figure 12: National weekly COVID-19 case rates by deprivation status for weeks 08 May – 12 June 2022



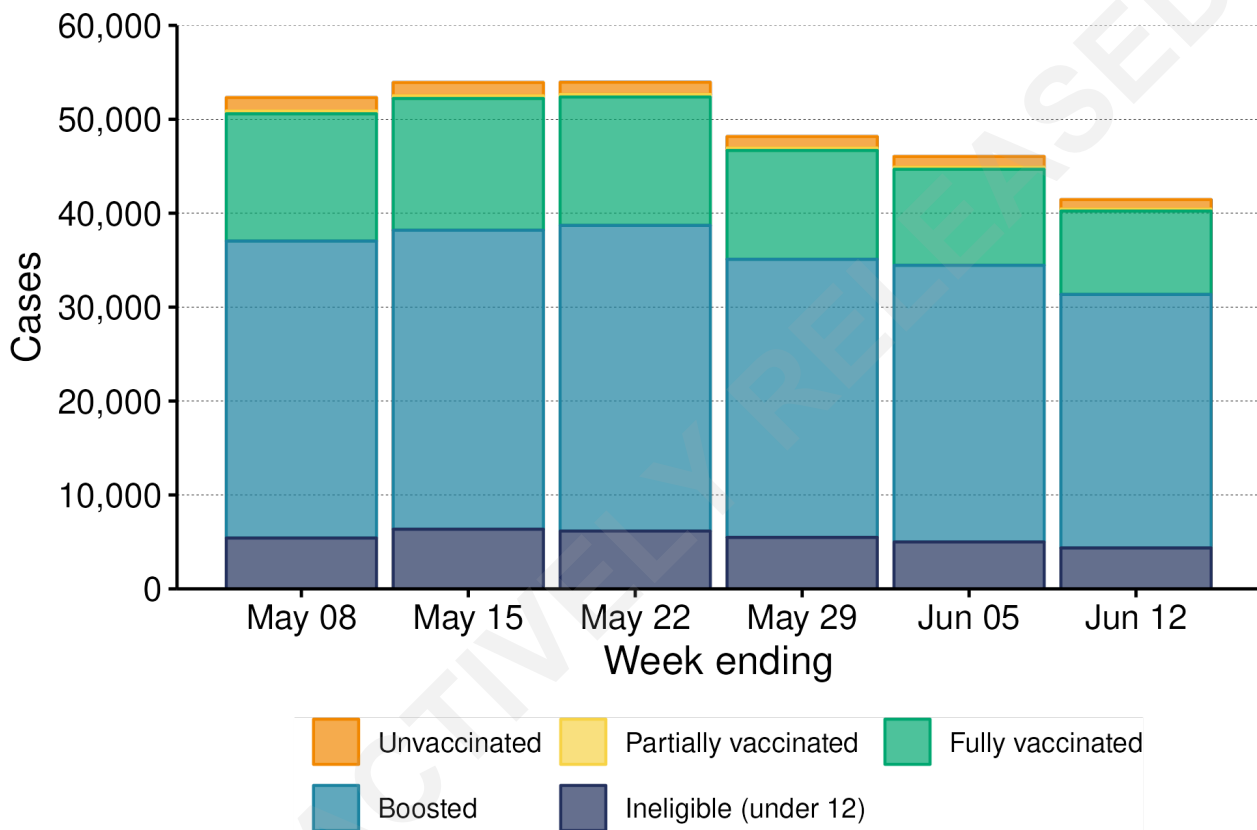
Source: NCTS/EpiSurv as at 2359hrs 12 June 2022

Vaccination trends over time

Figure 13 shows community case numbers by vaccination status nationally. The proportion of boosted cases is slightly higher than the week prior at 65% of all cases in the week ending 12 June. The proportion reported as fully vaccinated is slightly lower than the week prior at 21% of all cases in the past week.

The proportion of cases amongst those who are categorised as ineligible due to being under 12 years old⁵ is 10.5%. The proportion of cases reported as partially vaccinated remains constant at 0.5%, while cases reported in those unvaccinated remains similar to the week prior at 2.4%.

Figure 13: National weekly case numbers by vaccination status for weeks 08 May – 12 June 2022



Source: NCTS/EpiSurv as at 2359hrs 12 June 2022

⁵ 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 a 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, with increasing frequency. Wastewater data also continues to detect BA.4/5 and BA.2.12.1 at a number of sites.

As the BA.4/5 and BA.2.12.1 lineages have been detected in community samples, given the relatively small proportion of community samples referred for sequencing, this result suggests that these lineages have a foothold across the country and will likely grow in proportion in coming weeks. Wastewater data coupled with community case WGS results strongly suggest that BA.4/5 and BA.2.12.1 are circulating within the wider NZ population.

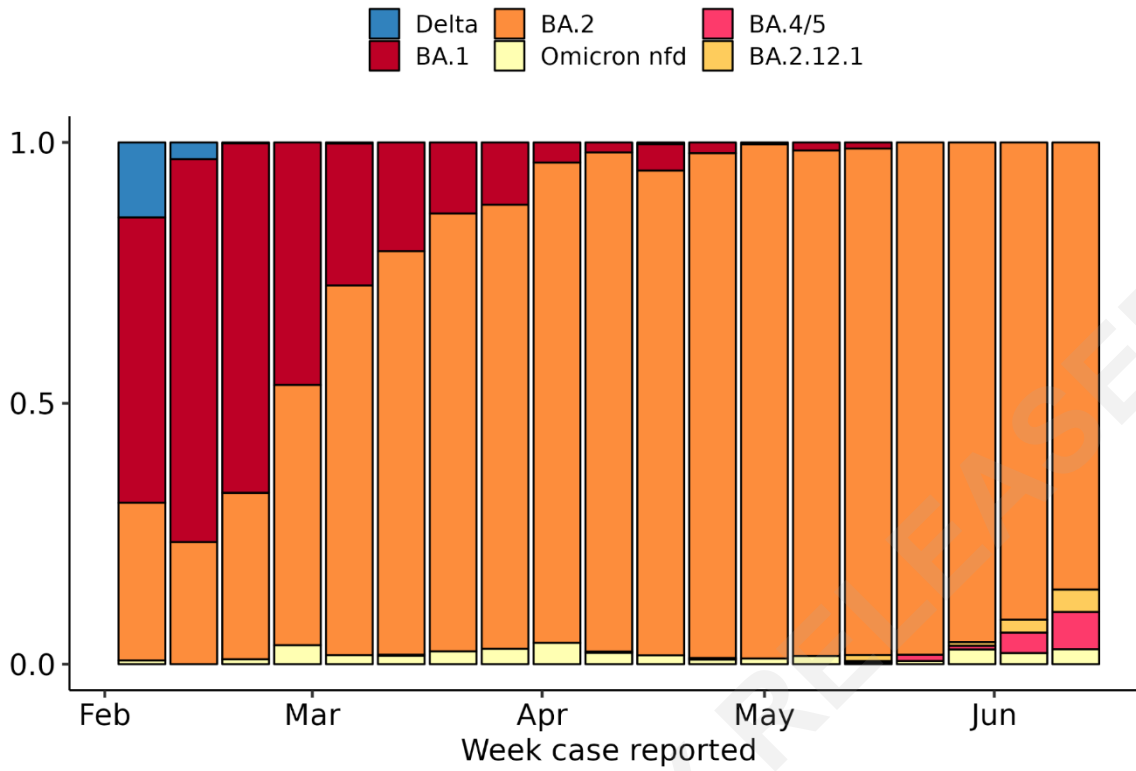
Figure 14 shows that Omicron is the dominant variant in New Zealand having outcompeted Delta, which made up ~70% of all sequenced cases at the start of January 2022 but fell to less than 10% of sequenced cases by the end of January 2022.

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 98% of sequenced community cases in the past two weeks. This matches international phylodynamic trends as BA.2 has enhanced transmission advantage compared to the BA.1 subvariant. **Figure 14 also shows the increasing frequency of BA.4/5 and BA.2.12.1 in community samples over the past few weeks.**

This places New Zealand in a different position to many other countries that are currently experiencing BA.4, BA.5, XE or BA.2.12.1 waves. BA.2 is closer to this most recent group of subvariants than BA.1. Therefore, due to a different variant history, it is not a given that waves seen overseas will necessarily translate to a wave of similar magnitude in New Zealand.

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

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



Source: ESR COVID-19 Genomics Insights Report #11, EpiSurv/Microreact 0900hrs 13 June 2022

Border Surveillance

Cases detected at the Air Border

Imported cases initially increased as travel volumes increased, but have been reducing since early May.

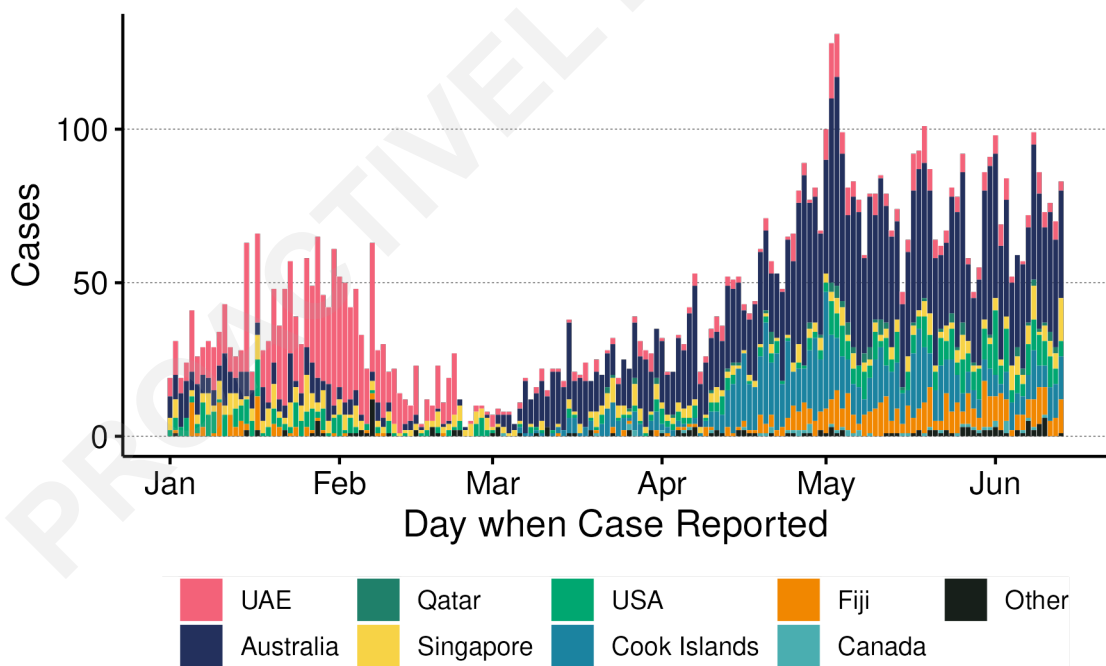
More than 2% of recent arrivals were reported as cases. This is similar to the rates seen in arrivals from Australia during quarantine-free travel in 2021, and above the 1% estimate used for planning Reconnecting New Zealand.

Figure 15 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. Since early March, most cases have arrived on flights from Australia, followed by the Cook Islands and Fiji, then the USA.

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 flight, as arrival cards are no longer scanned and data in the New Zealand Traveller Declaration system is incomplete.

Figure 15: Cases reported in post-arrival testing by country of flight departure, 01 January – 14 June 2022



All cases in recent air arrivals to 05:09 PM, Tuesday 14 Jun 2022
Cases counted from midnight to midnight

Source: NCTS/EpiSurv as at 2359hrs 14 June 2022

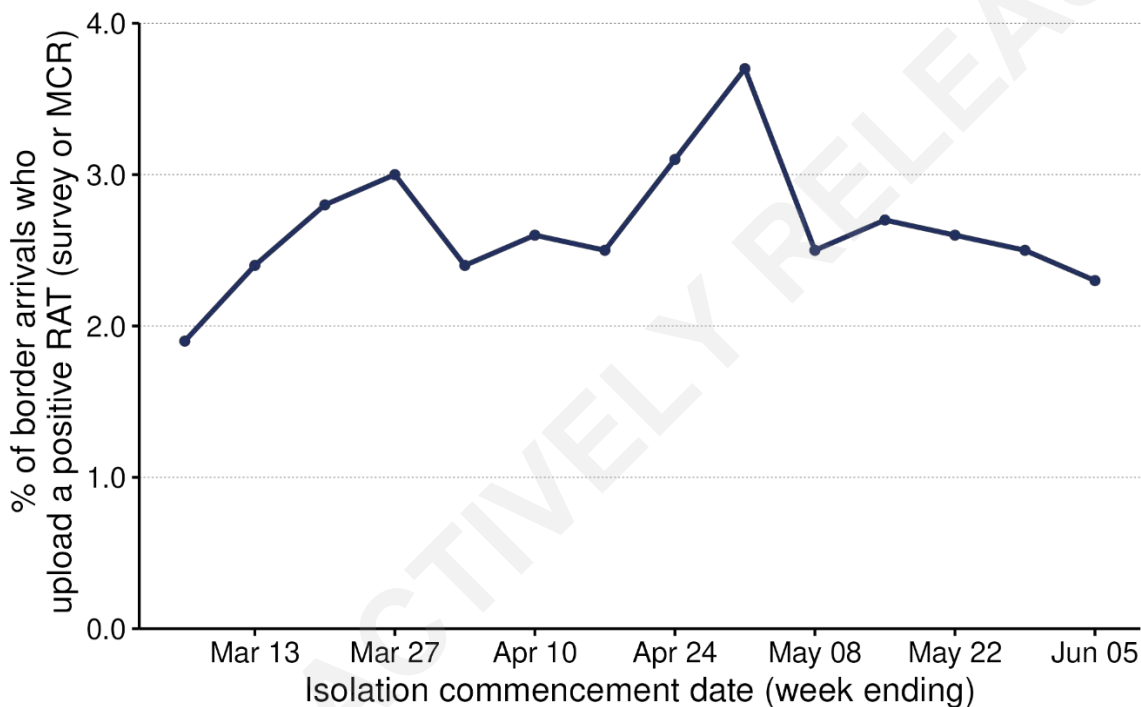
Testing of Border arrivals

Figure 16 shows that the percentage of positive Survey RAT tests among border arrivals (who reported a test) was mostly between 1 and 2.5% for the period 13 March – 05 June 2022. However, not all border arrivals record a Survey RAT result; some arrivals record their test result in My COVID Record. From mid-May to the week ending 05 June, the percentage of border arrivals returning positive RATs through either the survey or My COVID Record has been holding steady between 2-3% each week.

About 10% of arriving passengers leave the country before they are due to take a Day 5 test.

Testing and reporting of RATs at the border relies heavily on a “high-trust” model and as such, it is not expected that there will be 100% compliance with testing amongst travellers.

Figure 16: Percentage of positive tests from border arrivals who complete RAT tests, 28 February – 05 June 2022



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 05 June 2022

Whole Genomic Sequencing of Imported cases

Figure 17 shows the completion metrics for border returnee testing and WGS. For the period 07 March – 05 June 2022, the percentage of arrivals uploading a RAT has been constant with an average of 91.3%.

Figure 18 shows the border returnee testing and WGS metrics for arrivals. In the week ending 05 June, there were 38,058 border arrivals, of which 89.6% (34,114) uploaded a RAT result upon arrival. This is slightly lower than 90.7% from the week prior.

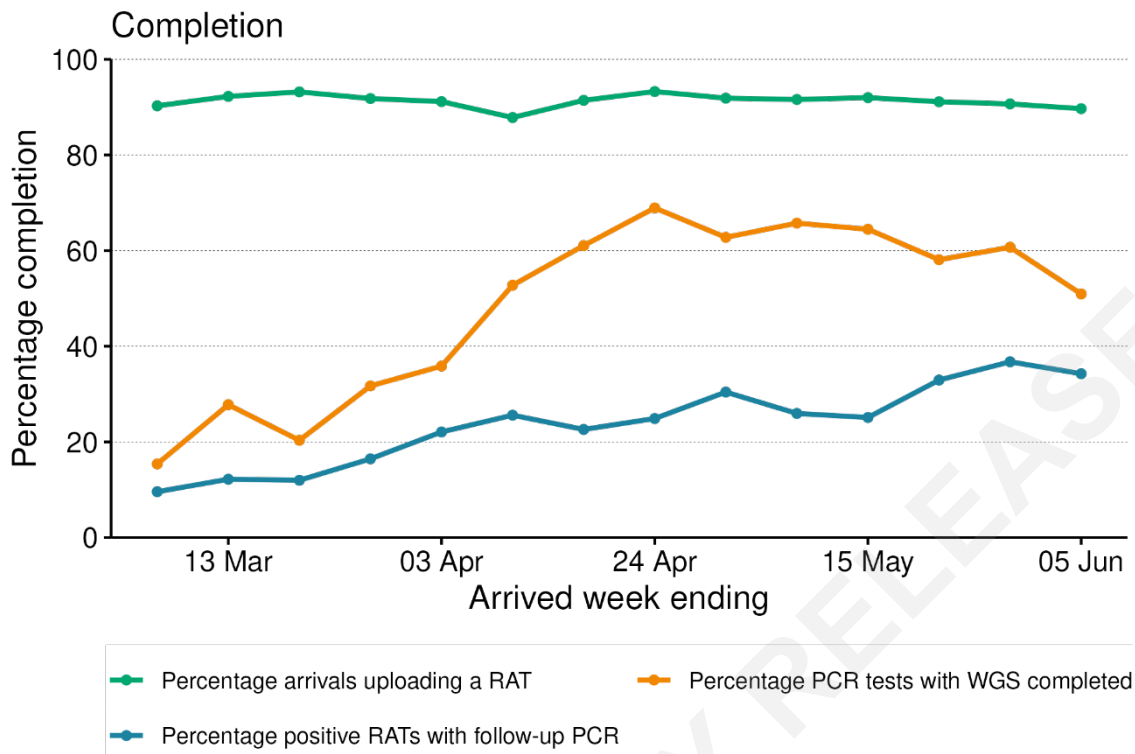
In the week ending 05 June, 34.2% of border arrivals who returned a positive RAT had a follow-up PCR test. This has decreased slightly from 36.7% the week prior.

In the week ending 05 June, the percentage of PCR positive border arrivals with WGS complete was 52.2%. However, please note that **WGS can be incomplete for recent cases**. This percentage was 60.8% for the week ending 29 May and 58.2% for the week ending 22 May.

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.

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.

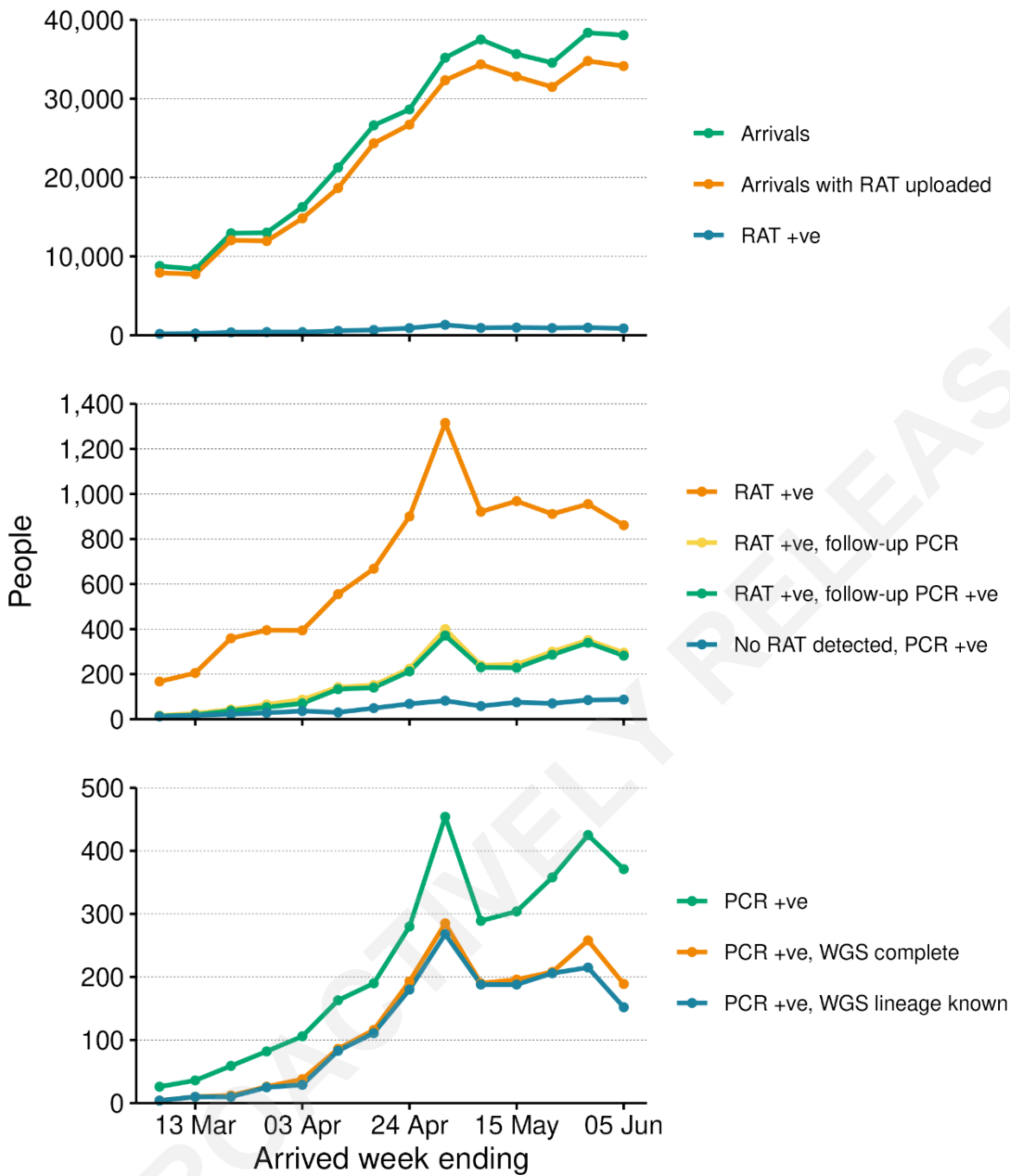
Figure 17: Completion metrics for border returnee testing and WGS for arrivals, 28 February – 05 June 2022



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 05 June 2022, ESR WGS 05 June 2022⁶

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

Figure 18: Border returnee testing and WGS metrics for arrivals, 28 February – 05 June 2022



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 05 June 2022, ESR WGS 05 June 2022⁷

⁷ Please note that WGS may not be completed/uploaded yet for more recent cases

Hospitalisation and Mortality

Hospitalisation Rates

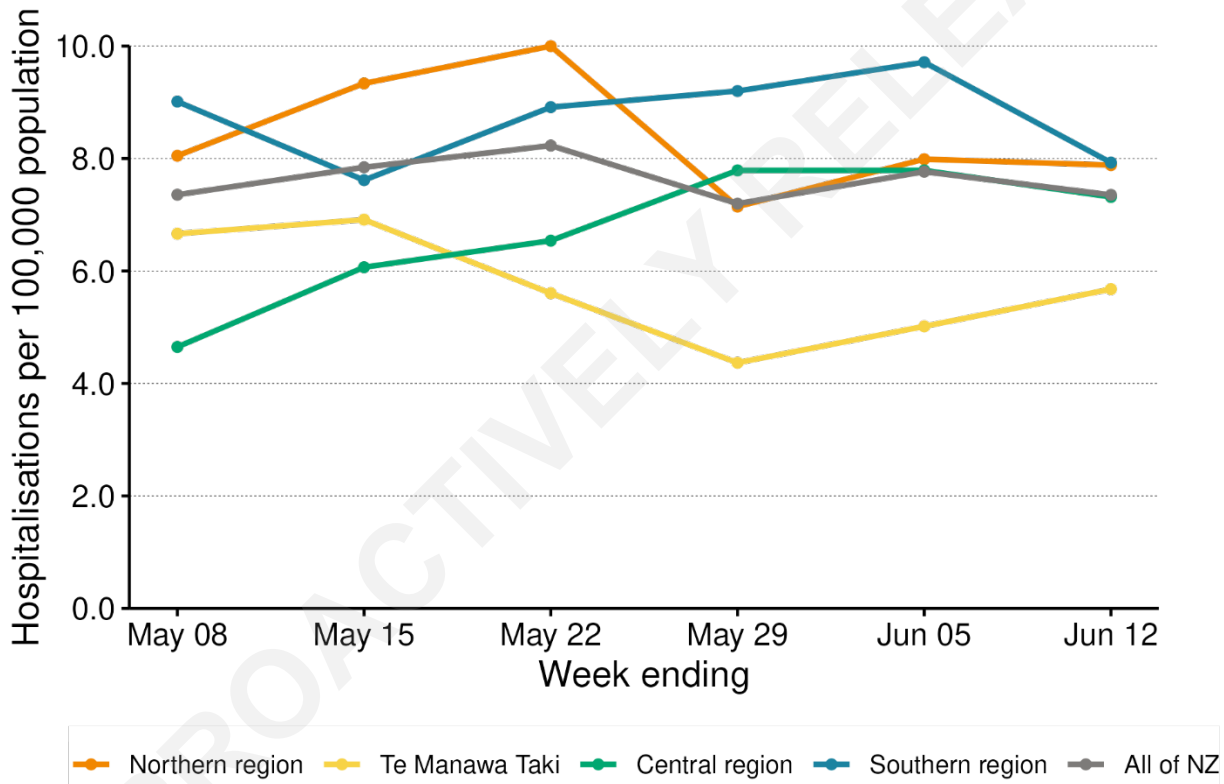
Due to varying definitions of an active case, there may be regional differences in the coding of COVID-19 infection status for hospitalisations.

Hospital Occupancy

For the week ending 05 June, the **national hospital occupancy rate was 7.4 per 100,000 population, a decrease of 6% in the past week (Figure 19).**

Hospital occupancy rates have continued to vary across regions in the past week. Central region (7.3 per 100,000) decreased by 6% and Southern (7.9 per 100,000) decreased by 23%, while the Northern region (7.9 per 100,000) decreased by 1% and Te Manawa Taki (5.7 per 100,000) increased by 12% in the past week.

Figure 19: Regional weekly hospital occupancy rate per 100,000 population, 08 May – 12 June 2022



Source: Daily hospital questionnaire as of 12 June 2022

Whole Genomic Sequencing of hospitalised cases

As of 13 June, ESR received samples from 96 of the 296 PCR positive hospital cases with a report date in the two weeks to 10 June 2022. Of these, 86% had a BA.2 genome, 3% were BA.1, 10% failed WGS and 1% were BA.2.12.1.

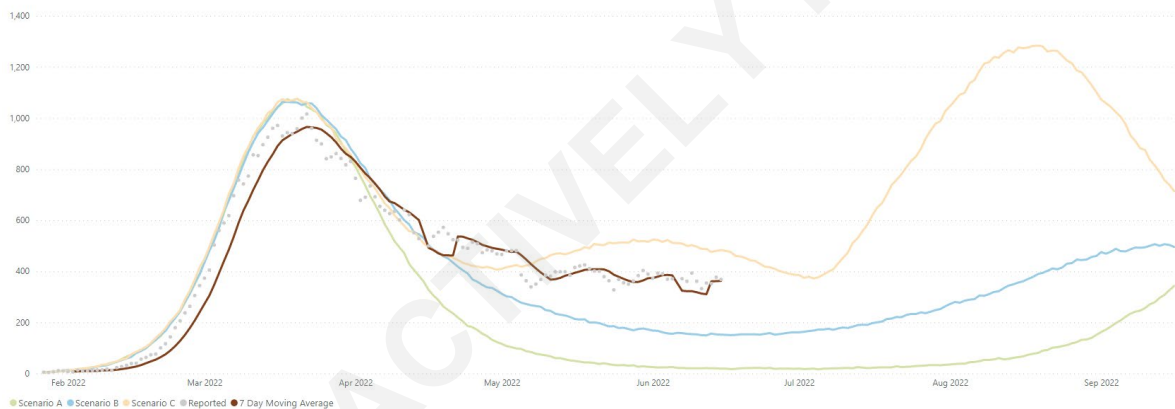
ESR now receives a daily list of active COVID-19 cases who tested positive in the past 14 days and were hospitalised in the past 7 days. ESR is working with the Ministry of Health to receive information on which cases have been admitted to ICU/HDU.

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 20**).

The number of hospital beds occupied by people with confirmed COVID-19 infections was approximately 8 per 100,000 population. This count includes infected people hospitalised for any reason, and at a national level is tracking between the modelled scenarios B and C – both of which expect an increase in hospitalisations. Cases are expected to rise with reinfections as population immunity wanes. The highest scenario shows what might happen if transmission continues to increase as people relax their protective behaviours.

Figure 20: CMA hospital occupancy scenarios compared to actual hospital occupancy



Sources: COVID-19 Modelling Aotearoa (CMA) Branching Process Model April 2022, and DHB reports to TAS of daily hospital occupancy (all COVID-19 positive people admitted as inpatients) as of 15 June 2022.

Mortality

As of 15 June 2022, 1,374 people have died with or from COVID-19 infection. Of these, 1,308 have died within 28 days of being reported as a case. **Figure 21** shows the 7-day rolling average of deaths by date of death, which was 7.9 as of 12 June 2022. Under-ascertainment of COVID-19 cases in the community could mean that the true 7-day rolling average of deaths is slightly higher than reported.

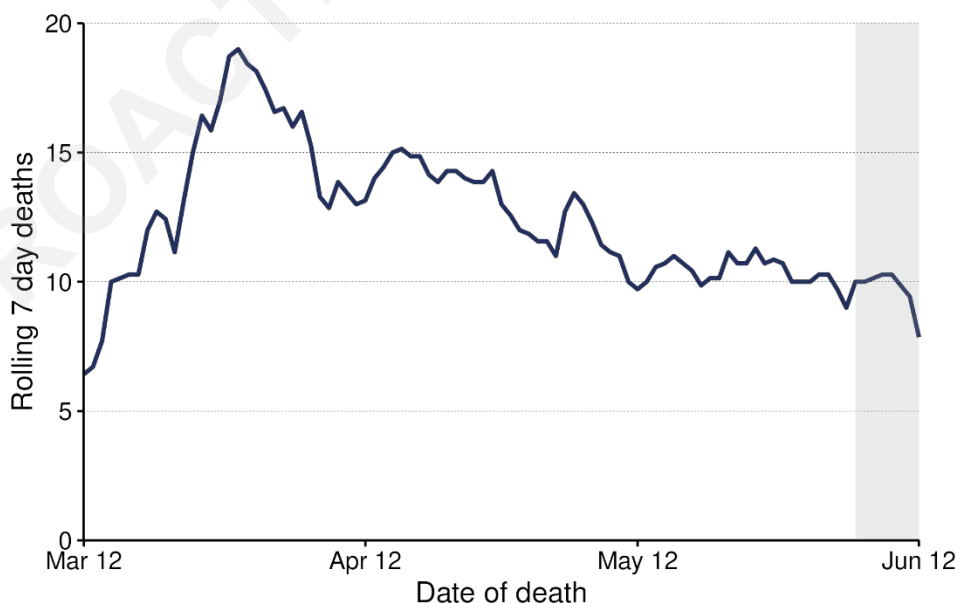
Figure 22 shows **COVID-19 related deaths by cause over time**. By 15 June 2022, there were 1,308 deaths with COVID-19 infection who died within 28 days of being reported as a case. Of these deaths that have been formally coded by cause of death, 544 (51%) were determined to have COVID-19 as the main underlying cause. COVID-19 contributed to a further 301 deaths (28%). Another 216 people died of a separate, unrelated cause (20%).

Figure 23 shows mortality by age and ethnicity from 01 March 2022 to 12 June 2022, the period when most cases were due to the Omicron variants. The trend is as expected across all age groups, with the older population dying with COVID-19 at a higher rate than the younger population. The mortality rate for those aged 90+ is highest at 13.7 per 1,000 population. The mortality rate for those aged 80-89 is 3.4 per 1,000; and for those aged 70-79 is 0.9 per 1,000. The mortality rate for younger age groups is far below 1 per 1,000 population.

Across age groups, **Pacific and Māori have consistently higher mortality than Asian and European or Other** ethnicities. These age-stratified deaths by ethnicity are based on small numbers of events and some rates have wide confidence intervals.

Of people aged 90+, Pacific Peoples have the highest mortality rate at 58.4 per 1,000 population, while Asian is the lowest at 9.3 per 1,000. For people aged 80-89, Pacific Peoples have the highest mortality rate at 14.7 per 1,000 population, while Asian is again the lowest at 2.0 per 1,000.

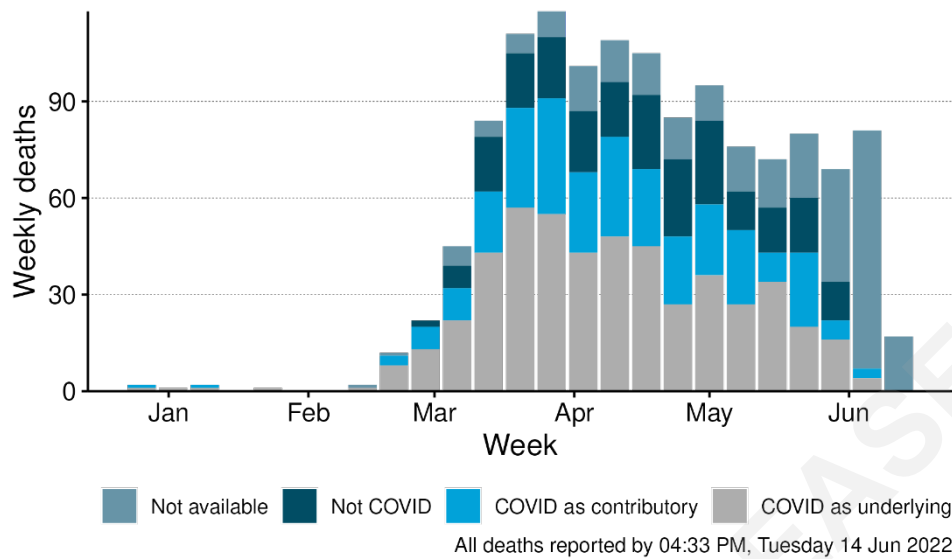
Figure 21: 7-day rolling average of deaths within 28 days of COVID-19, by date of death, 12 March – 12 June 2022



Source: NCTS/EpiSurv as of 12 June 2022⁸

⁸ In the shaded grey area, additional deaths may still be pending report.

Figure 22: Deaths by cause, 01 January – 14 June 2022

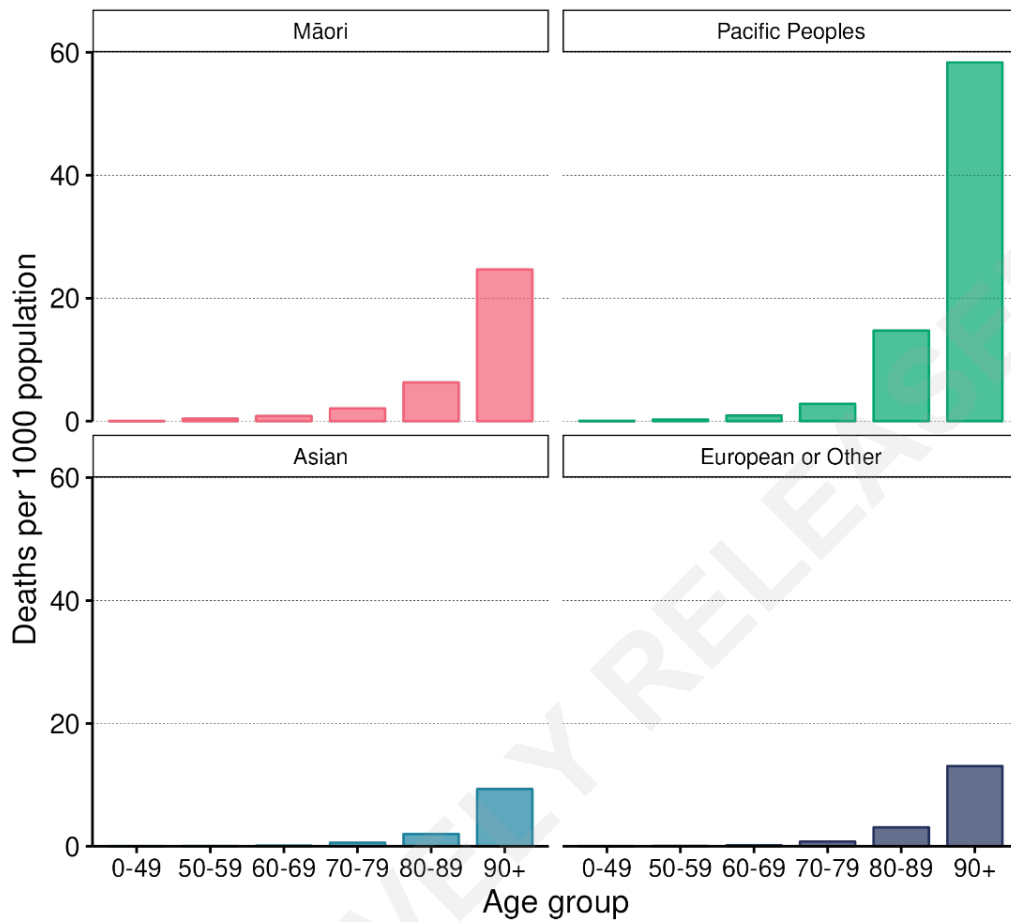


Source: Ministry of Health, all 2022 deaths by date of death within 28 days of report as COVID-19 case, and all other 2022 deaths where COVID-19 was the underlying or a contributory cause

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.

Figure 23: Rates of all deaths with or after COVID-19 infection per 1000 population, by Age and Ethnicity, 01 March – 12 June 2022



Source: NCTS/EpiSurv as of 12 June 2022

All cause death rates

This section is under review. Details are published by Statistics NZ at <https://www.stats.govt.nz/experimental/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 and waning immunity

Globally, the number of new weekly cases has continued to decline since a peak in January 2022. In the week ending 12 June 2022, over 3.2 million cases were reported, similar compared to the previous week. The number of new weekly deaths has risen after five weeks of decline with over 8700 fatalities reported, a 4% increase compared to the previous week.

At the regional level, the number of new weekly cases increased in the Eastern Mediterranean Region (+58%), in the South-East Asia Region (+33%) and in the Region of the Americas (+13%), while it decreased in the other three WHO regions. The number of new weekly deaths increased in the Region of the Americas (+21%) and Western Pacific Region (+17%), while decreasing trends were observed in the other four regions. As of 12 June 2022, over 533 million confirmed cases and over 6.3 million deaths have been reported globally.

The Omicron VOC remains the dominant variant circulating globally, accounting for 97% of sequences reported. Among Omicron lineages submitted to GISAID, BA.2 represents 39%, while BA.2.12.1 represents 28%, BA.5 represents 6%, and BA.4 represents 3%. For epidemiological week 20 (15 to 21 May 2022) and week 21 (22 to 28 May 2022), there was a 4% decline in the number of BA.2 sequences, while there were increases of 4%, 3%, and 2% in BA.5, BA.2.12.1, and BA.4 sequences respectively.

USA

As of 08 June 2022, the current 7-day rolling average of daily new cases in the United States (109,032) increased by 8% compared with the previous 7-day rolling average of 100,916.

CDC Nowcast projections for the week ending 04 June 2022 estimate the combined national proportion of lineages designated as Omicron to be 100%. The predominant Omicron lineage in the United States is BA.2.12.1, with the national proportion of BA.2.12.1 projected to be 62.2%; BA.2 is projected to be 24.8%; BA.5 is projected to be 7.6%; BA.4 is projected to be 5.4%.

Excess mortality data for the United States⁹ is only available up to 3 April when it was -3.34%.

Portugal

Portugal has seen a decline in cases, indicating that the peak of the BA.5 wave may have been reached in late May 2022. During this period, PCR S-gene target failure (SGTF) data indicated that BA.5 made up 87% of sequences in Portugal.

According to the Portuguese National Institute of Health, mortality from all causes was above the expected value for this time of the year, likely indicating an excess of all-cause mortality. Excess mortality was 14.04% as at 22 May 2022⁹.

⁹ Our World in Data (OWID). Please note, data is only available to late May and not for all countries.

France

The BA.4 and BA.5 sub variants are now estimated to account for around 19% of new COVID cases in France and are thought to be contributing to a moderate increase in overall new case numbers.

Over 90% of the French population is fully vaccinated, while over half the population has already been infected by the Omicron variant – in particular, the population has experienced a wave of sub-variant BA.2. However, Public Health France recently confirmed that levels of circulation of the new sub variants are still too low to provide any robust data or insight into protection due to vaccination or prior infection.

Excess mortality data for France⁹ is only available up to April 17 when it was 4.31%.

South Africa

Mortality data suggests that the number of excess deaths in South Africa increased by 146% between 19 March – 28 May 2022. There were 750 excess deaths in the week ending 19 March compared with 1,844 in the week ending 28 May.

Reported cases in South Africa have been declining since 11 May 2022.

United Kingdom

The UK may be at the start of a new wave of infections driven by the BA.4 and BA.5 Omicron subvariants. Although BA.2 continues to account for the bulk of UK infections, data as of 02 June from the Office for National Statistics (ONS) suggests that COVID-19 cases may be starting to rise again in England and Northern Ireland; the trends were uncertain in Wales and Scotland.

According to the latest ONS data, around one in 70 people in England were estimated to have COVID-19 in the week leading up to 02 June. In Northern Ireland, this was about one in 65, in Wales about one in 75 and in Scotland about one in 40. They report further that the BA.5.1 subvariant is also gaining ground in the UK, and the BA.2.12.1 subvariant (the USA's dominant COVID strain), which the UK Health Security Agency continues to monitor.

Australia

Australia had its worst May on record for influenza cases. The national disease surveillance system reported around 65,770 confirmed influenza cases in May, more than double the previous record, which was set in 2019.

As of 05 June, there had been nearly 88,000 reports of influenza with more than 47,800 of them having been confirmed in the past fortnight. Additionally, Australia reported 23,754 COVID-19 cases with a 7-day rolling average of 30,918.

Primary evidence on effectiveness of infection prevention and control measures

This section outlines some of the available literature about the effectiveness of infection prevention and control (IPC) and 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 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).

- [An Australian study](#) found that in the early phase of an outbreak, containing a wild type-dominant epidemic to a low level (≤ 10 cases/day) would require effective combinations of social distancing and face mask use interventions to be commenced before the number of daily reported cases reaches 6. Containing an Alpha-dominant epidemic would require more stringent interventions that commence earlier. For the Delta variant, public health interventions alone would not contain the epidemic unless the vaccination coverage was $\geq 70\%$.
- [A systematic review of economic evaluations of COVID-19 interventions](#) found that treatment, public information campaigns, quarantining identified contacts/cases, cancelling public events and social distancing were deemed highly cost-effective. The authors also concluded that accounting for broad non-health impacts and distributional effects is essential for a comprehensive assessment of interventions' values.

Evidence brief on Masking mandates

The evidence that mask wearing decreases the rate of transmission of SARS-CoV-2 (and other airborne respiratory viruses) is substantial. Masks are effective at preventing transmission of SARS-CoV-2 to a contact (protection) or preventing transmission of SARS-CoV-2 from a case (source control). Mask wearing becomes more efficacious when combined with other public health measures that reduce the risk of transmission.

Trends suggest that masking reduced the risk of acquiring COVID-19 in school settings as there were no other substantial changes in factors that predict risk that would be limited to school-aged children only. In addition, comparing rates in teachers who were absent due to COVID-19 with the general population suggests an increase in transmission in the school environment in Term 2.

A study was published in May 2022 assessing the relationship between local mask wearing policies and the adherence to mask wearing in 126 cities in the United States.¹⁰ **Having a local mask mandate increased the odds of wearing a mask 3-fold (OR = 2.99, P = .0003) compared to no recommendation.** People observed in rural areas were least likely to wear masks. Correct mask use was greatest in December 2020 and remained high until June 2021 ($P < .0001$).

It is difficult to determine from the available data if the removal of mask mandates from schools after the move from CPF (COVID-19 Protection Framework) Red level to Orange impacted on the rate of transmission within schools for several reasons. Most importantly, the removal of mask mandates was associated with changes to other measures such as capacity limits used to control the transmission of COVID-19 infection. However, some indirect evidence regarding any varying risk of infection within schools may be obtained by comparing the rate of infection in school age children and in teachers over time and with similar cohorts. This could indicate that schools are a potential "engine" of transmission of COVID-19 within the community.

Therefore, we have provided an analysis of case rates in school aged children comparing with adults over the period 03 April to 05 June, which encompasses school term break and changes to the mandates. The weekly incidence rate among susceptible populations (defined as those who have not had a previous infection, vaccination status was not considered) are shown in Figure 24. Age breakdowns within children are chosen to match different school settings; primary, intermediate, and high school. The beige block represents school terms; Term 1 finished 14 April and Term 2 began 2 May. The dashed orange line marks the change to CPF from Red to Orange.

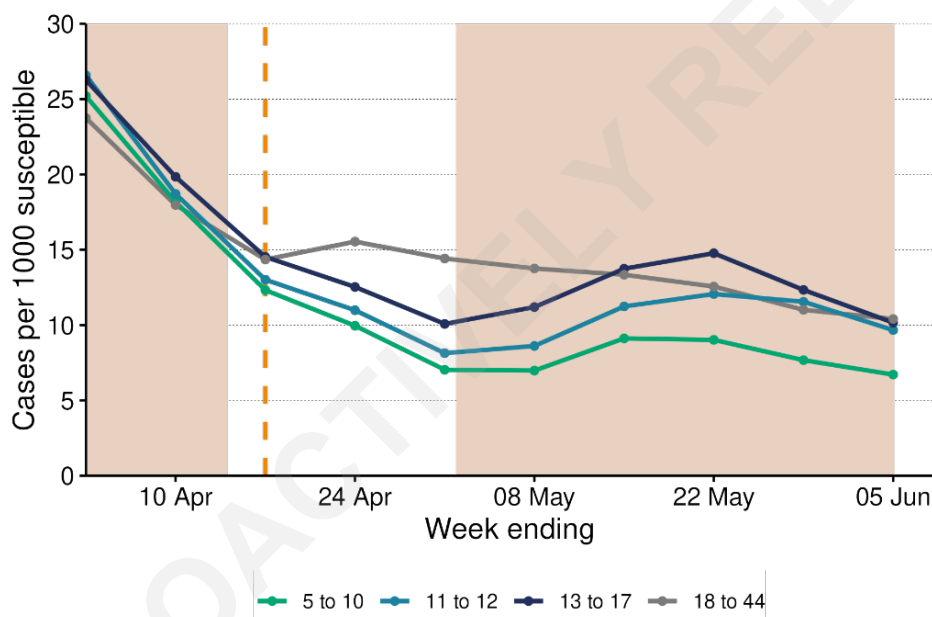
¹⁰ Eric J. Puttock, et al Association of masking policies with mask adherence and distancing during the SARS-COV-2 pandemic, American Journal of Infection Control, 2022.

Initially there was a steady decline in rates among susceptible school aged children and adults during school Term 1; in the two weeks to 17 April (the first Sunday of school holidays), there was a 50% decrease in the rate in all school aged children (5-17 years) and a 40% decrease among adults. The decline in cases among school aged children continued during school term break as well (a 39% decrease to Sunday 1 May), after which there were sudden substantial increases in rates after their return to school (an increase of 35% in the first 2 weeks, which continued in the following week as well). However, for adults during school holidays, overall, the rate changed little, and then continued to decrease after school holidays (however at a slower rate, with ~10% decrease from 1 to 15 June).

In general, prevalence drives incidence and given adult rates were falling, this would not appear to be the explanation for school aged children having increased rates in mid-May. Furthermore, rates were declining before school holidays, when there was school-based transmission risk for children; with the return of children to school the trend reversed.

These trends could suggest that masking reduced the risk of acquiring COVID-19 in school settings as there were no other substantial changes in factors that predict risk that would be limited to school-aged children only.

Figure 24: COVID-19 case rates in school aged children and adults aged 18-44



School terms are indicated in beige shading, school holidays in white shading. Rates in children declined before and during the holidays but increased when school resumed. Rates in adults (grey) were not impacted as markedly during and after the school holidays.

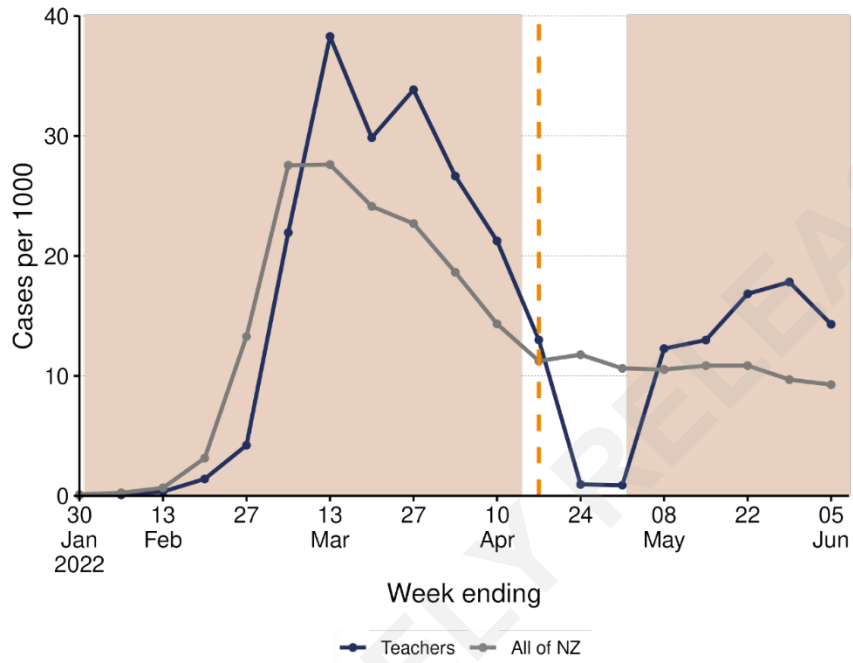
The Ministry of Education collects information on teacher absences due to COVID-19, as special arrangements for sick leave are provided for teachers due to COVID-19 infection.

A comparison between the case rates in teachers and the total population would indicate their rate of infection is higher than that of the general population [refer to Figure 25]; however, it is also possible that their case ascertainment is higher than the general population, although teachers are not required to undertake regular asymptomatic screening.

The evidence suggests an increase in transmission in the school environment in Term 2 as:

- a. there was a similar pattern of decreasing rates at the end of Term 2 and increasing at the start of Term 3 as seen in school-aged children, and
- b. trends in the total population were of continued decreasing rates, unlike the increase seen in teachers.

Figure 25: The rate of infection in teachers compared to all of NZ. cases per 100 per day, week



Health System Capacity

Omicron Dashboard

The Omicron dashboard (**Figure 26**) 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 09 June 2022.

PROACTIVELY RELEASED

Figure 26: Omicron Health Sector Clinical Indicators Dashboard summary, week ending 09 June 2022

Sector	Summary of data
General Practice	Sector leaders have not raised any new items of concern over the past week. Changes in GPQED rates vary widely by geographical area, encounter rates are 5.3% higher than at the same time last year.
Urgent Care	The number of patients being seen in a red stream is remaining stable at approximately 3,000 patients per week. The proportion of red stream consultations is holding steady at around 30%. This is the first week in nearly two months that a clinic had to close early, or reduce services due to staff shortages.
Flu Tracking	Severe Acute Respiratory Infection (SARI) incidence rates per 100,000 in the Auckland region rate of hospitalisations is now the highest in 2022 so far other than the last week reported (week to 22 May). This is the first time since 2019 that influenza has been the most commonly identified virus among these patients.
Aged Residential Care	19% of the 656 Aged Residential Care (ARC) facilities have at least one active COVID-19 case (127 of 656 facilities). This is a reduction from last week which was 20% of facilities having a positive case.
Pacific Health	Bay of Plenty, Hutt Valley and Capital & Coast DHBs have been hosting workshops with Pacific health providers to share learnings from their COVID-19 and Care in the Community responses. The workshops are also being used to plan for future Pacific-focused responses and events for their regions. Pacific providers continue to use innovative ways to promote vaccination across community groups.
Emergency Ambulance Service	111 call volumes and EAS incident volumes have continued to be high during the last four weeks. This is putting additional pressure on the ambulance sector. St John has stood up its Emergency Operations Centre to help manage its response to the demand increase.
Disability	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.
Hospital	Nationally, occupancy of over 90% increased to 50% (previously 48%). Four hospitals reported occupancy over 90% for 20 or 21 censuses: Wellington, Rotorua, Gisborne, and Hutt Valley.
ED	ED attendances this week are among the highest numbers since reporting commenced. Number of ED presentations shows the same pattern as number of admitted patients.
Planned Care (Hospital)	Planned care continues to be reduced across the motu however levels vary depending on region.
Pharmacy	Similar to last week, Pharmacies are experiencing staff shortages (locums and permanent), reduced operating hours for some and staff are fatigued.
Home and Community Services	Continuing to see a reduction in total numbers of employees compared with October-December last year (9% decline) and continue to see a decline in total services delivered compared with October-December last year (4% decline).
Health Workforce	The International Recruitment Campaign for Critical Care Nurses has received 133 applications as of 3 June.
Critical Care Workforce	Critical care workforce absences due to COVID exposure or illness have increased at Auckland City Hospital, Wellington and Dunedin Hospitals over the past week. Waikato Hospital critical care absences have decreased over the past week.
COVID care in the community	The percentage of cases contacted has remained consistent in the past week and has been constantly over 98%. The last week shows a decrease in both assessments completed within 24 and 48 hours. Assessments completed within 24 hours decreased from 64.5% to 55.5%. The percentage of clinical assessments completed within 48 hours for Māori has increased last week from 70.7% to 79.2% while Pacific groups decreased by 4.7% to 71.1%.

Sources: Omicron Health Sector Clinical Indicators Dashboard, 09 June 2022

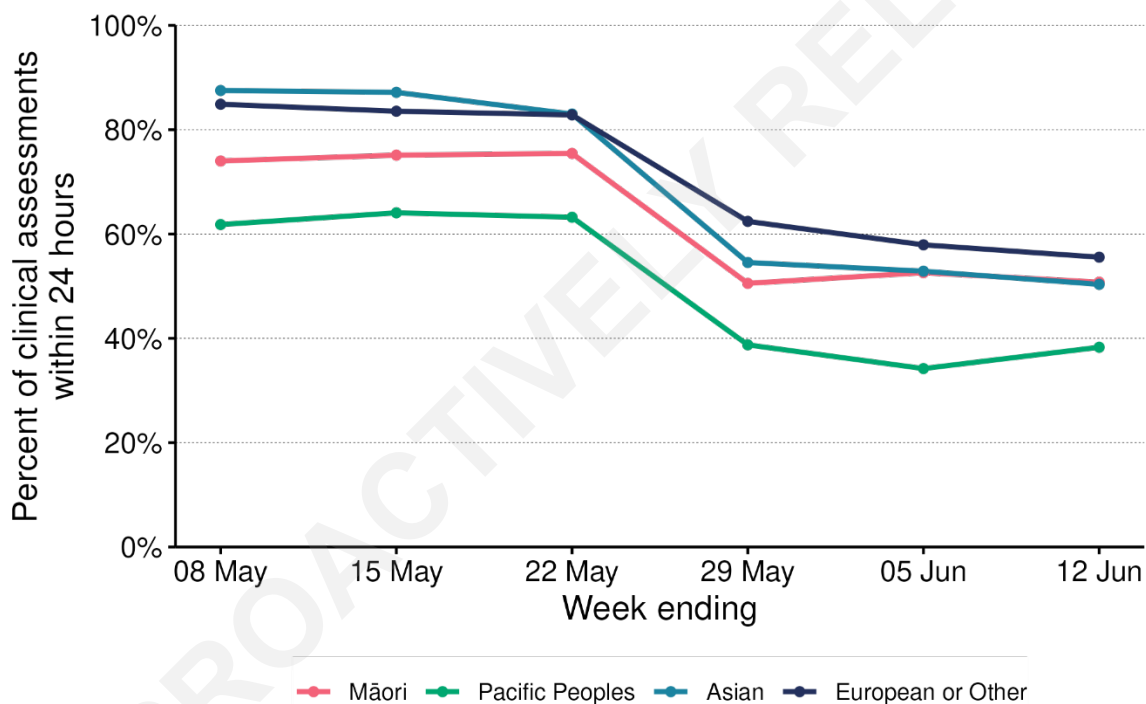
Care in the Community

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 27 shows the percentage of clinical assessment completed within 24 hours by Ethnicity. In the week ending 12 June 51% of Māori, 38% of Pacific Peoples, 50% of Asians and 56% of European or other had clinical assessment completed within 24hrs. This trend has been similar for all ethnic groups for the past three weeks.

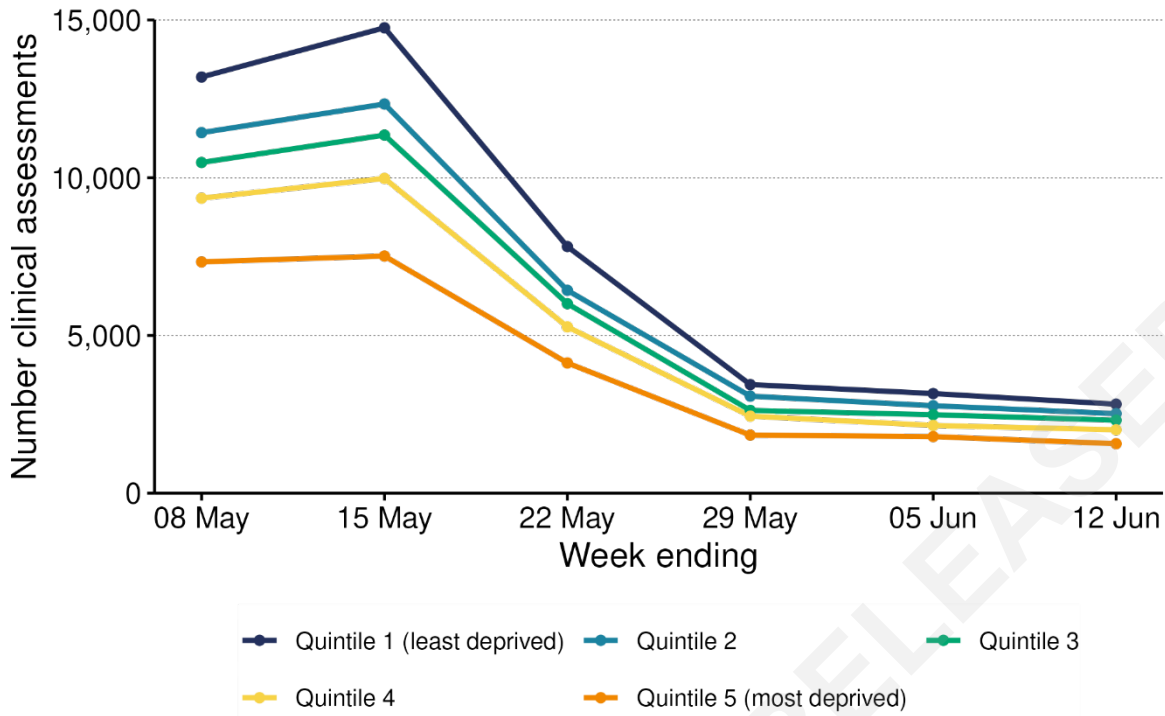
Figure 28 shows the number of clinical assessments by deprivation. People residing in the least deprived areas have a higher number of completed clinical assessments compared to those living in the most deprived areas, a difference of 1253.

Figure 27: Percent of initial clinical assessment completed within 24 hours of positive case by ethnicity



Sources: CCCM/QLIK, Socrates 12 June 2022

Figure 28: Number of clinical assessments by deprivation



Sources: NCTS, 12 June 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 asymptotically 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 the Northern Region rather than identifying inpatients in the national testing database; they are therefore more accurate than the national figures. However, this data is currently only available for the Northern Region.

Wastewater quantification

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.
- Northern region 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 outside of the Northern Region
- 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.
- Recent changes to the way case data is collected and processed may have resulted in some uncertainties in the case counts and the catchments to which they are mapped. While this is being resolved, the case data presented in this report should be used as a guide only and is subject to change. ESR are continuing work to improve the algorithms for how cases are assigned to wastewater catchments, including integrating a new meshblock data feed recently made available from NCTS.

PROACTIVELY RELEASED