COVID-19

Trends and Insights Report

Updated 01 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 7.2 per 1,000** population for the week ending 26 June. This rate has **increased** from 7.0 per 1,000 population in the previous week.
- **For the week ending 26 June**, estimates suggest that **1.6% (489/31,323) of healthcare workers** and **1.2% (254/20,790) 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 (1.2% [12 per 1,000] versus 6.9 per 1,000**, respectively).
- Levels of viral RNA in **wastewater have increased slightly in Auckland Metro and Central regions with slight decreases or plateaus in all other regions**
- While case rates across the four regions have fluctuated over the past few weeks (generally trending downwards), the relatively stable wastewater trends over the same timeframe indicate that there may have been no substantial decreases in new infections.
- In the past week, **11 out of 19 DHBs experienced an increase in case rates.** There was a 6% increase in Auckland, a 7% increase in Counties Manukau, a 7% increase in Waitemata, a 14% increase in Tairāwhiti, an 11% increase in Capital and Coast, an 8% increase in Hawke's Bay, a 2% increase in Hutt Valley, a 2% increase in Whanganui, a 15% increase in Canterbury, a 2% increase in South Canterbury and an 18% increase in West Coast DHB.

Demographic Trends in Case Rates

- The **lowest case rates** continue to be in **Pacific Peoples (3.1 per 1,000)**; case rates in this group have decreased by **5.8% in the past week. Māori case rates have also declined** and are now at **4.2 per 1,000.**
- **For the 65+ age group,** case rates in the Northern region increased by 14.8%, Te Manawa Taki increased by 28.0%, Central increased by 7.8% and Southern increased by 0.4% 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 9.4 per 1,000 and 65+ at 7.6 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 76% 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.4/5 variant of Omicron is a key observation – it now makes up approximately 10% of community cases in the past fortnight. ESR estimates that **BA.5 will likely become the dominant variant around mid-July, and 90% of cases in early August. How this may translate into case numbers is the subject of updated prevalence modelling from COVID Modelling Aotearoa group, which will be distributed next week.**
- As of 26 June, ESR received samples from and had processed 63 of the 300 PCR positive hospital cases with a report date in the two weeks to 24 June 2022. Of these, 65% had a BA.2 genome, 1% were BA.2.12.1, 6% were BA.5 and 22% were Omicron unassigned.

Border Surveillance

- In the week ending 19 June, there were 41,657 border arrivals, of whom **88% (36,678) uploaded a RAT result upon arrival.** This is slightly lower than the 90% in the week prior.
- In the week ending 19 June, **2% to 3% of recent arrivals tested positive** via RAT. The rate of active cases per arrival may be increasing after remaining steady during May and June even while total arrivals were increasing.
- In the week ending 19 June, the percentage of PCR positive border arrivals with WGS complete was 39.5%. This percentage was **72.7% for the week ending 12 June and 71.0% for the week ending 5 June.** (Please note that WGS can be incomplete for recent cases.)
- **Cases in border arrivals rose sharply after the data cutoff for this report.** By 29 June, they had more than doubled to over 200 reports per day. While sudden, this 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.

Hospitalisation and Mortality

- For the week ending 26 June, the national hospital occupancy rate was 6.9 per 100,000 population, **a decrease of 6.8% from the week prior.** Hospital occupancy rates have decreased across all regions in the past week. The Northern region (7.6 per 100,000) decreased by 2.8%, Te Manawa Taki (5.6 per 100,000) decreased by 5.0%, **the Central region (7.5 per 100,000) decreased by 19% in the past week**, and Southern (6.4 per 100,000) decreased by 2.1%.
- As of 26 June 2022, there were 1,451 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 **22% were found to be due to unrelated causes**, such as accidents.

International and Scientific Insights

- Globally, the number of **new weekly cases has increased for the third consecutive week**, after a declining trend since the last peak in March 2022. In the week ending 26 June 2022, over 4.1 million cases were reported, **an 18% increase as compared to the previous week.** The number of new weekly deaths **increased by 13% compared to the previous week, with over 8,500 fatalities reported.**
- **In the week ending 19 June 2022, BA.2 represented 25% among Omicron sequences, while BA.2.12.1 represented 11%, BA.4 represented 12% and BA.5 represented 43%.** Comparing the proportion of Omicron sequences submitted during the week ending 12 June and 19 June, BA.2 declined from 30% to 25%, BA.2.12.1 declined from 18% to 11%, **while BA.4 increased from 9% to 12% and BA.5 increased from 28% to 43%.**
- The Victorian Department of Health has reported that the prevalence of **BA.4 and BA.5 in Victorian metropolitan and regional wastewater catchments has risen significantly in recent weeks.** The BA.4 and BA.5 subvariants are expected to overtake BA.2 in the coming weeks to become the dominant strain in Victoria. This is in line with similar patters observed in New South Wales and Queensland.
- In the week ending 27 June, BA.2 represented 56% of Omicron sequences submitted by Australia to GISAID, while BA.2.12.1 represented 5%, **BA.4 represented 9%, and BA.5 represented 30%.**
- The scientific insights section includes studies on outbreak management, economic evaluations, transmission dynamics and modelling studies.

Health System Capacity

- For the week ending 22 June, **22% of the 656 Aged Residential Care (ARC) facilities had at least one active COVID-19 case** (146 of 656 facilities).
- **ED presentations decreased slightly over the past week from a 5-day rolling average of 4,040 ED presentations on 14 June to 3,829 on 20 June.** However, while there were slightly less incidences of ED occupancy over 90% than the previous week, ED occupancy remains high.
- National SSED for all patients seen and treated in **6 hours in ED was 74% week ending 19 June** (compared with 73% week ending 05 June).
- **Hospitals continue to experience high occupancy, with Wellington, Hutt Valley, Tauranga, Rotorua and Palmerston North hospitals all being over 90% capacity at every census point** in the week ending 22 June. The number of acute patients with a Length of Stay (LOS) of 7 days or over continues to increase across the motu and is the highest recorded at 1,467 patients currently in hospital for 7 days or more.
- **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

- **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, cases have increased in all regions expect Te Manawa Taki.** There has also been a 23% increase in border worker cases from the Northern region since the 12th of June. This supports recent insights that cases could be increasing in the community, as wastewater levels have also increased in the Auckland metro and Central regions in the past week.
- Infection levels are likely to be higher than the self-reported cases indicate as wastewater RNA has not decreased substantially despite an overall substantial decrease in case rates since the March peak. **There could be a divergence occurring between wastewater trends and case rates as community case rates were higher at similar wastewater levels earlier in the year.**
- 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 remaining public health measures, which may be increasing risk of infection, especially among vulnerable populations.
- Cases in those who are **65 years and older have increased** in the past week with **65+ year olds in Māori and Pacific Peoples having higher rates** compared to Asian and European or Other.
- EpiNow modelling suggests that there **has been an unexpected increase in transmission**. This may be driven by the increase of BA.4 and BA.5 as WGS indicates their prevalence in the community has increased by 10% in the past fortnight.
- 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 may result in **an increase in infections in the coming weeks**. However, the actual impact on new infections and hospitalisations are still unclear, at this stage.

Tertiary Care outlook

- **Inpatient test positivity for COVID-19 has plateaued for the past five weeks** and is now 25 per 1,000 inpatients.
- 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.

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Figures

Infection Trends

Summary of evidence for infection and case ascertainment trends

Currently, **the national border workforce case rates in the past week (12.2 per 1,000) were higher than the general population (7.2 per 1,000);** these rates were similar when comparing border workforce rates in the Northern region among 25-44 year-olds at 11.2 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 continued decreasing in all regions.** This decrease is consistent at a national level across all ethnicities and age groups.

Inpatient test positivity at tertiary hospitals across the motu has plateaued for the past five weeks with approximately 2.5% (25 per 1000) of inpatients testing positive for COVID-19. This also suggests no substantial change to underlying levels of infections.

Levels of viral RNA in **wastewater have plateaued or decreased slightly in the past week in Northern region, Southern region and Te Manawa Taki, and have increased in Auckland Metro and Central region.** However, **levels in all regions remain similar to those seen in mid- to late-February** (early March for Southern). Contradictory to community case trends, 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 4 months.**

Modelled case rates are tracking closely to modelled scenario '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]: 0.9-1.2) for cases to 25 June, suggesting that cases are likely to remain at current levels or grow for the next week.

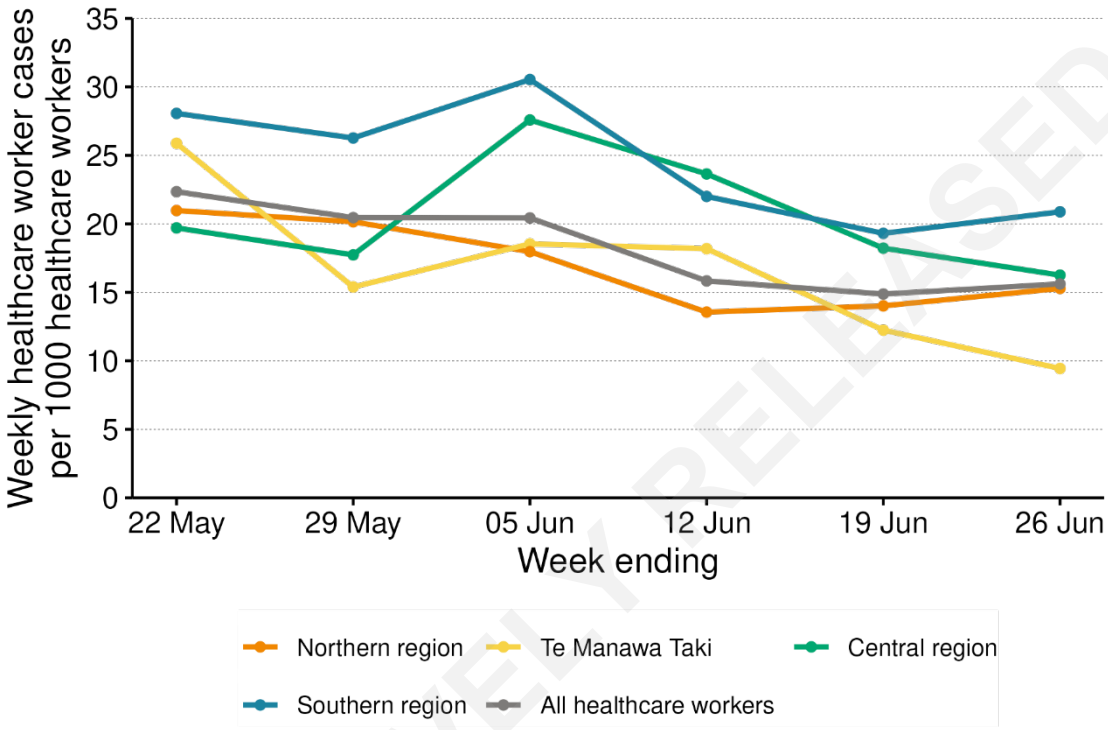
Approximation of underlying infection incidence

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.

[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.

For the week ending 26 June, estimates suggest that 1.6% (489/31,323) of healthcare workers (**Figure 1**) and 1.2% (254/20,790) of border workers[2] (**Figure 2**) have tested positive (for the first time). The rate for Northern border workers in the 25-to-44-year age group was 1.1%. Border worker comparisons with Auckland case rates suggest under ascertainment of cases (1.2% [12 per 1,000] versus 6.9 per 1,000, respectively).

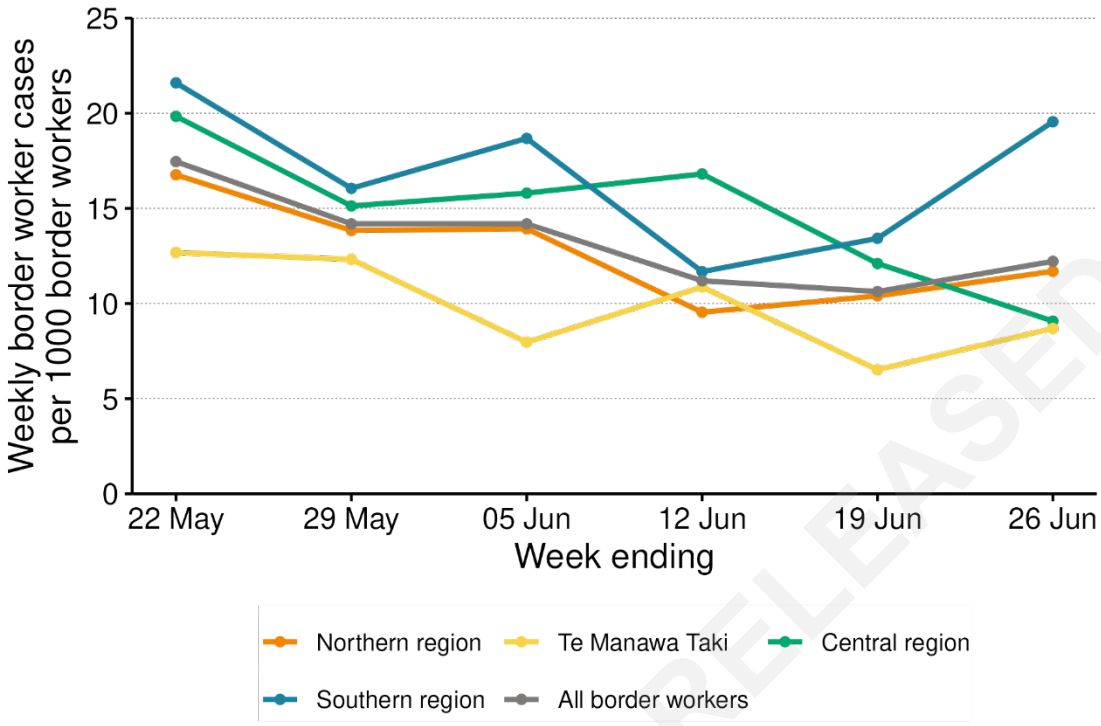
Figure 1: Regional weekly case rates of health care workers for weeks 22 May – 26 June 2022



Source: Éclair/Episurv, 2359hrs 26 June 2022

[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 border workers for weeks 22 May – 26 June 2022

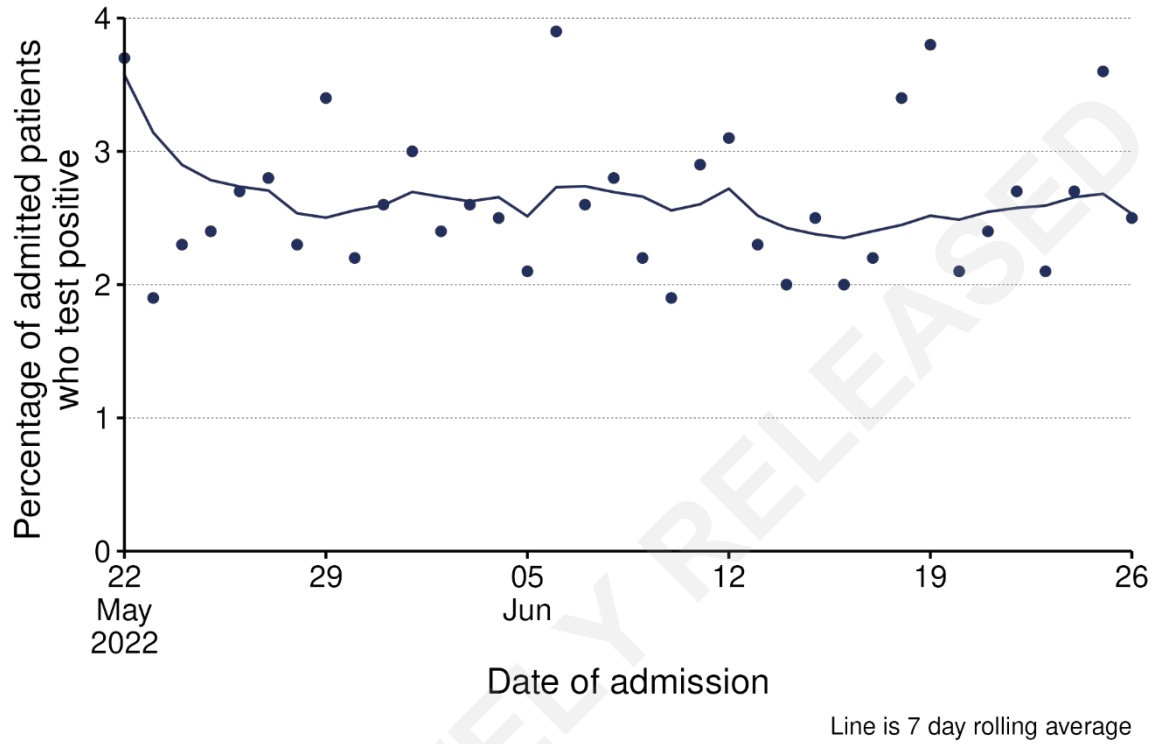


Source: Éclair/Episurv, 2359hrs 26 June 2022

Test positivity trends among tertiary hospital admissions

Inpatient test positivity trends for tertiary hospital admissions[3] is shown in **Figure 3**. Tertiary hospital admission **positivity has continued to plateau for the** past five weeks, with a 7-day rolling average of 2.5% (301/11,893) for the week ending 26 June.

Figure 3: Percent of tests positive among tertiary hospital admissions



Source: Tertiary hospitalisation data, NCTS & EpiSurv as at 2359hrs 26 June 2022

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

Wastewater quantification

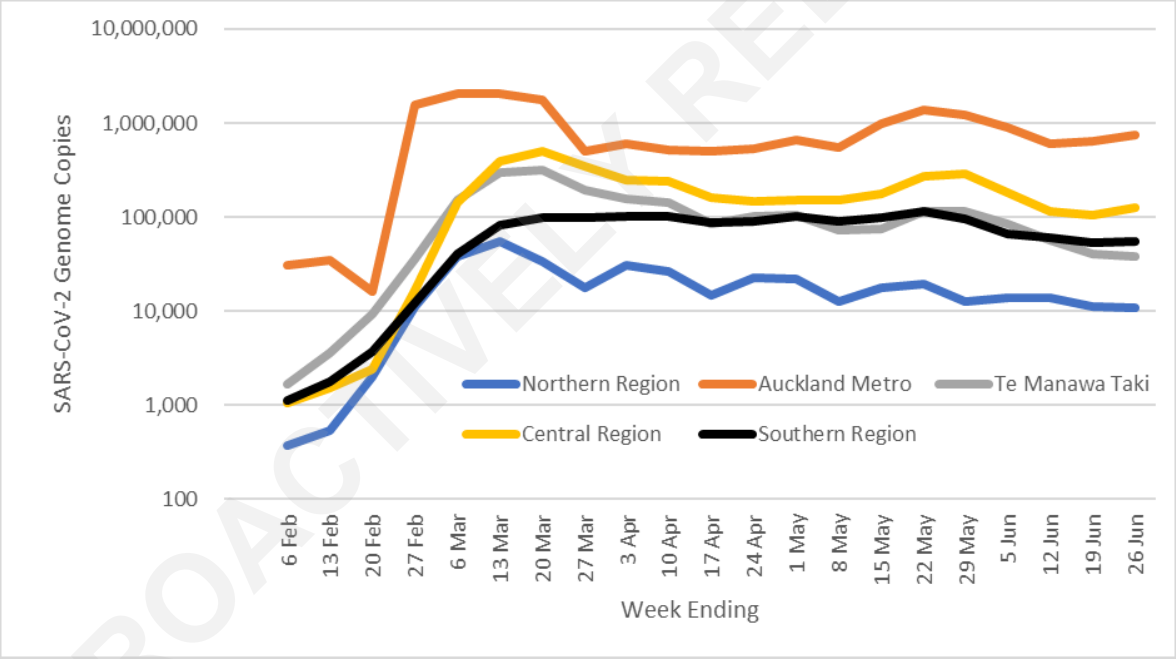
Figure 4 provides an overview of wastewater results by region. Please note that it is not appropriate to compare SARS-CoV-2 absolute levels by region; this figure can only be used to assess the trends *within* each region.

The SARS-CoV-2 RNA levels in wastewater in the Northern region (excluding Auckland Metro) have had small variations since peaking in mid-March, but **overall show signs of plateauing.** Auckland Metro rates peaked in mid-May and **were decreasing, but now have increased slightly in the week ending June 26.**

Te Manawa Taki and Central regions have been trending similarly and have **both had an overall decrease in the past three weeks; however, Central has increased slightly in the past week**. Southern region wastewater trends have been stable for the past few months **but have decreased slightly since mid-May**.

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 – 26 June 2022



Source: ESR SARS-CoV-2 in Wastewater update for week ending 26 June 2022

Trends in diagnosed cases

Overall, **the weekly case rate was 7.2 per 1,000** population for the week ending 26 June. This is a **slight increase from the previous week,** which was 7.0 per 1,000.

Figure 5 shows that case rates have increased across all regions except Te Manawa Taki in the past week. The Northern region rate (6.3 per 1,000) increased by 6% in the past week, Southern region (9.8 per 1,000) increased by 8% and Central region (8.2 per 1,000) increased by 3%. Te Manawa Taki (5.2 per 1,000) decreased by 6%.

In the past week, **11 out of 19 DHBs experienced an increase in case rates**. There was a 6% increase in Auckland, a 7% increase in Counties Manukau, a 7% increase in Waitemata, a 14% increase in Tairawhiti, an 11% increase in Capital and Coast, an 8% increase in Hawke's Bay, a 2% increase in Hutt Valley, a 2% increase in Whanganui, a 15% increase in Canterbury, a 2% increase in South Canterbury and an 18% increase in West Coast DHB.

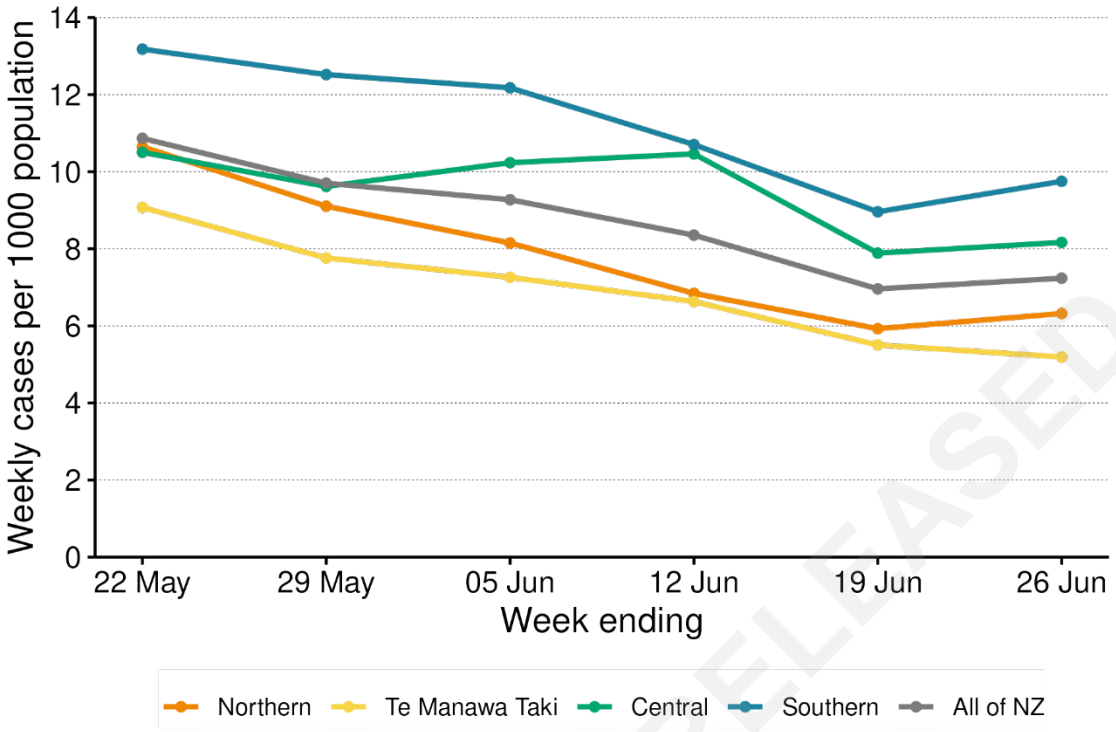
In the Northern region, the weekly case rate was highest for **Waitematā (7.5 per 1,000)** followed by Auckland DHB (6.9 per 1,000).

In Te Manawa Taki, weekly case rates were highest in **Taranaki (7.7 per 1,000)**, followed by Tairawhiti DHB (5.4 per 1,000).

The highest weekly case rates in the Central region were in **Capital and Coast (10.8 per 1,000)** followed by Hutt Valley (9.5 per 1,000). Other DHBs in the Central region had weekly case rates between 5 and 8 per 1,000.

In the Southern region, the highest case rates were in **Canterbury (10.6 per 1,000)** followed by West Coast DHB (9.4 per 1,000) and Nelson Marlborough DHB (9.2 per 1,000).

Figure 5: Regional weekly case rates for weeks 22 May – 26 June 2022

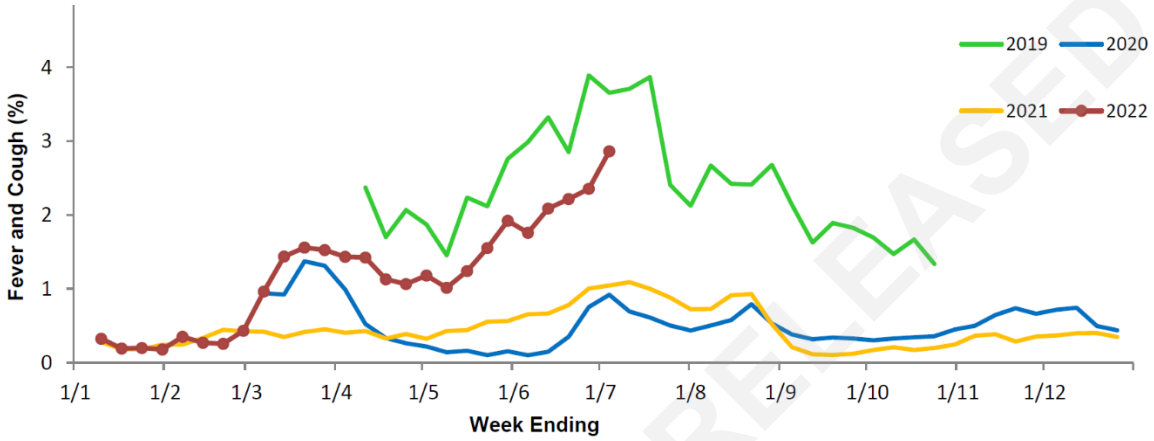


Source: NCTS/EpiSurv as at 2359hrs 26 June 2022

Trends in Influenza-like Illness symptoms

Figure 6 shows self-reported FluTracking of Influenza-like Illness (ILI) symptoms. Percentage of fever and cough is trending above what was reported in 2020 and 2021, but 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 6: FluTracking Influenza-like illness symptoms



Source: Weekly FluTracking Report for week ending 26 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 7**). 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.

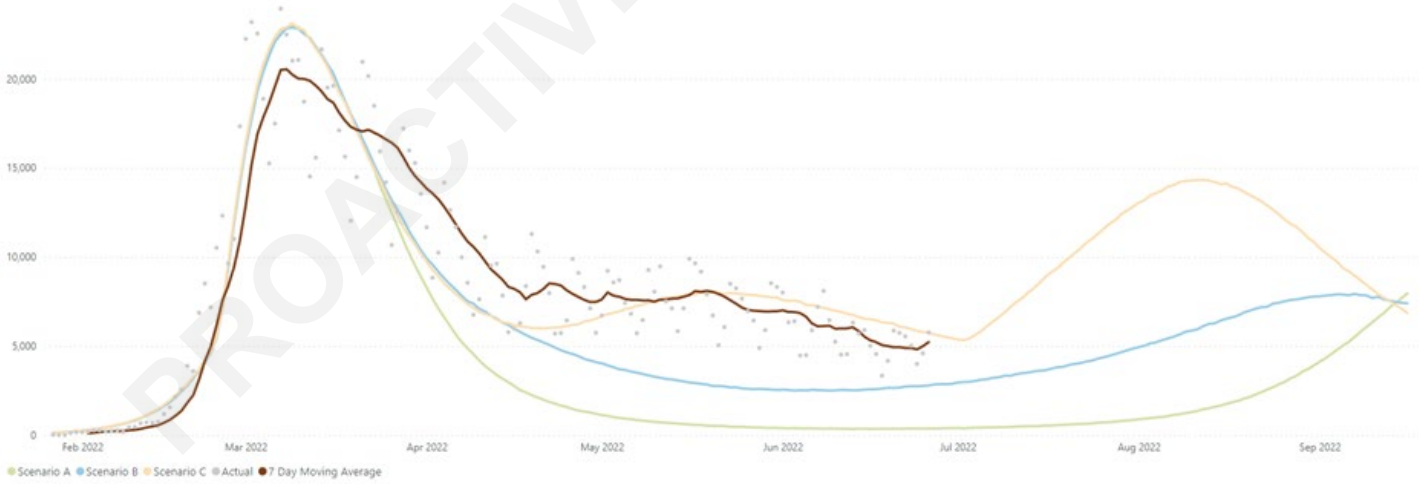
All three scenarios feature waning immunity after vaccination and/or infection, which leads to a "winter wave" beginning as early as July (Scenario C).

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.

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 7: 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 26 June 2022

The model scenarios are scheduled to be updated next week to better fit observed cases, and to include the arrival of the more transmissible Omicron BA 5.

Effective reproduction rate, and forecasts of cases and infections

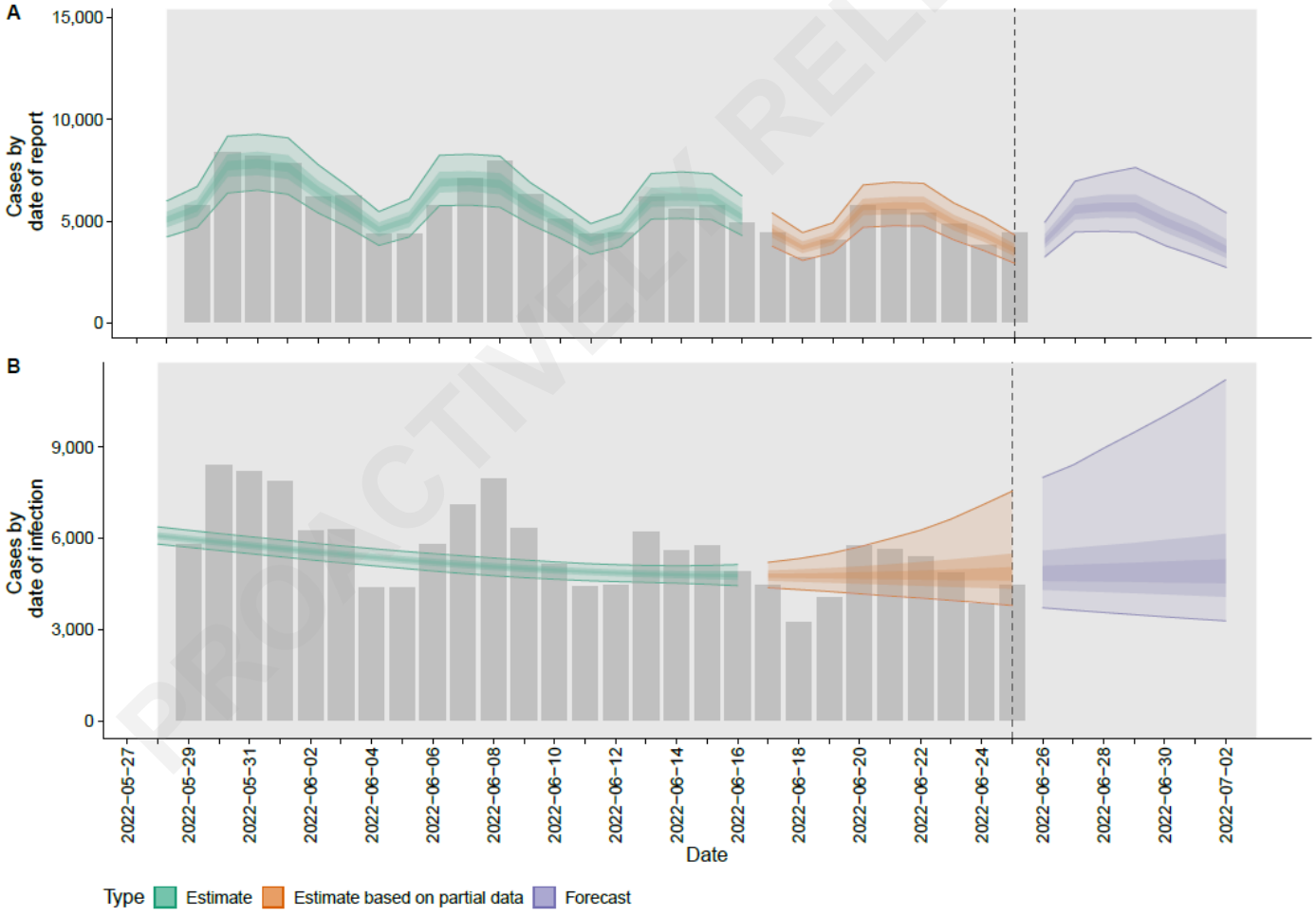
These estimates used the *EpiNow* package[2] on 27 June using data to 25 June.[4] The median estimate of **effective R (R_{eff}) nationally is 1.0** (90% Credible Interval [CI]: 0.9-1.2) for cases to 25 June, after adjusting for data lags; this is **above the previous week**. The confidence interval indicates a low to moderate level of uncertainty for this estimate.

Figure 8 compares the previous week's model median estimate for 25 June 2022 of 2,773 cases per day with a 50% credible interval of 2,449 – 3,146 to the actual reported cases of 3,827. This 38% underestimate was 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 0.7 – 1.1.**

The model's median estimate is that national reported cases could be 3,607 cases per day by 02 July (50% credible interval: 3,199 – 4,108). However, the credible intervals for the projected cases would be even wider if the possibility of continuing trend changes in effective R were included.

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



Source: EpiNow 27 June 2022, based on NCTS and EpiSurv cases

[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.

Demographic trends in case rates

Ethnicity trends over time and by region

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

In the past week, **case rates declined for Māori and Pacific Peoples and increased for Asian and European or Other 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 8.4 per 1,000** (up from last week's 7.8 per 1,000). The **lowest case rate continues to be in Pacific Peoples (3.1 per 1,000),** which is a 5.8% decrease from last week (3.3 per 1,000). The Māori case rate has decreased by 3.8%, from 4.4 per 1,000 in the previous week to 4.2 per 1,000.

Case rates in the Northern region for European or Other were 7.6 per 1,000 and rates for Asian were 6.8 per 1,000. Māori had the second lowest case rate at 4.1 per 1,000. Pacific Peoples (2.8 per 1,000) continued to have the lowest case rates in this region.

Case rates for Te Manawa Taki were highest for European or Other (6.4 per 1,000), comparable to Asian (5.8 per 1,000). Māori had the second lowest case rate at 2.9 per 1,000 followed closely by Pacific Peoples who had the lowest case rates in this region at 2.3 per 1,000.

Case rates in the Central region were highest for European or Other (9.4 per 1,000), comparable to Asian (8.6 per 1,000). Māori had the second lowest case rate at 4.4 per 1,000 followed closely by Pacific Peoples who had the lowest case rates in this region at 3.9 per 1,000.

In the Southern region, case rates were highest for Asian (10.5 per 1,000) and European or Other (10.1 per 1,000). Māori had the second lowest case rate at 7.2 per 1,000 followed closely by Pacific Peoples who had the lowest case rates in this region at 4.7 per 1,000.

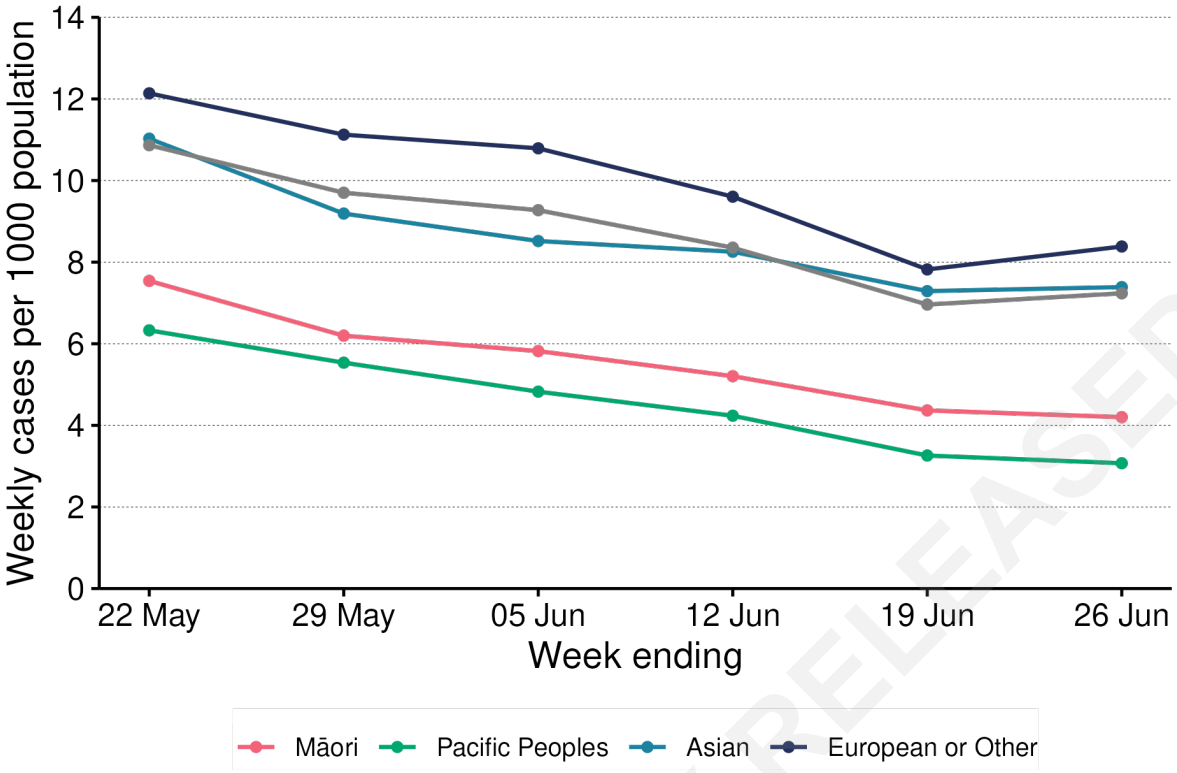
Figure 10 shows national case rates by ethnicity and a further breakdown by age group. The **highest case rates** out of any cohort were **within those aged 25-44 of European or Other ethnicity (9.9 per 1,000)** whilst the lowest case rates were in those aged 0-4 of Pacific Peoples ethnicity (1.4 per 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 and 25-44 age groups. For European or Other, case rates were 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, with European or Other increasing in the past week. In the week ending 26 June, case rates for Asians aged 65+ were 4.1 per 1,000 (9.3% decrease from week prior). Case rates for European or Other aged 65+ were 7.6 per 1,000 (13% increase from week prior). Case rates in Pacific People aged 65+ were 4.5 per 1,000 (13.8 decrease from week prior). Case rates in Māori aged 65+ were 5.1 per 1,000 (8.5% decrease 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 9.4 per 1,000 and 65+ at 7.6 per 1,000).

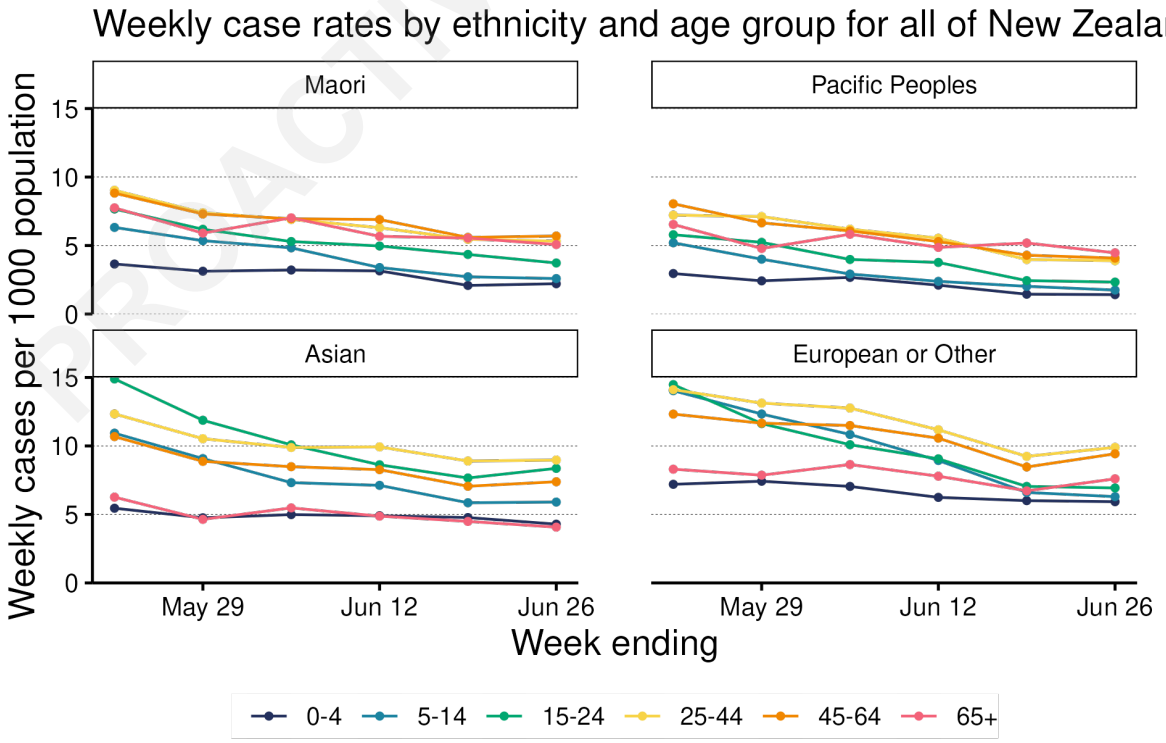
As Māori and Pacific Peoples have lower life expectancies than other ethnicities in Aotearoa New Zealand, they are likely to have a higher risk for COVID-19 complications at a younger age than other ethnicities.

Figure 9: National weekly case rates by ethnicity for weeks 22 May – 26 June 2022



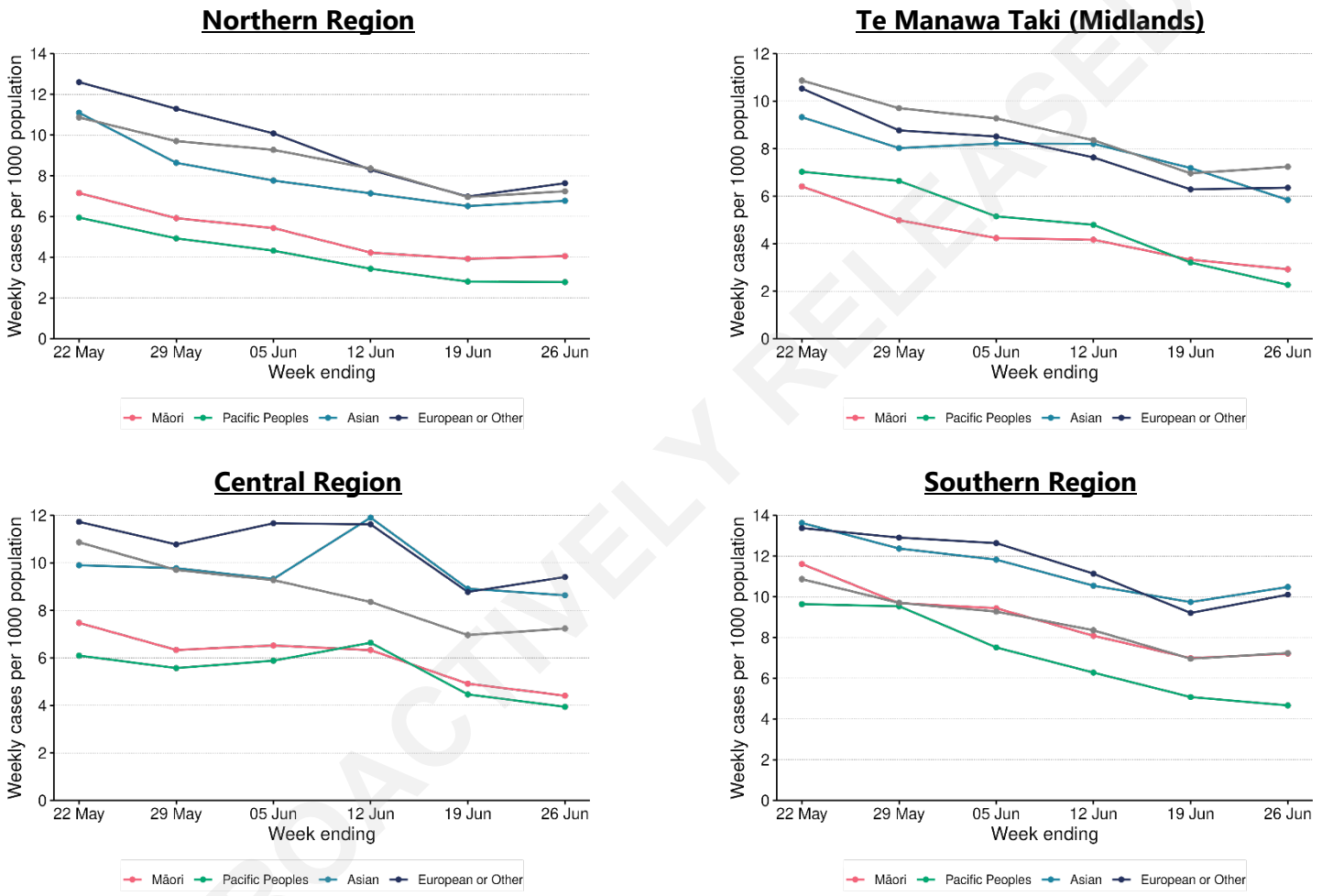
Source: NCTS/EpiSurv as at 2359hrs 26 June 2022

Figure 10: National ethnicity-specific weekly case rates by age group for weeks 22 May – 26 June 2022



Source: NCTS/EpiSurv as at 2359hrs 26 June 2022

Figure 11: Regional weekly case rates by ethnicity for weeks 22 May – 26 June 2022



Source: NCTS/EpiSurv as at 2359hrs 26 June 2022

Age trends over time and by region

Figure 12 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 0-4 and 5-14 age groups (4.3 and 4.9 respectively); 25-44 and 45-64 age groups (8.6 and 8.5 respectively)** in the past week. Those aged 0-4 continued to have the lowest weekly case rate at 4.3 per 1,000. The 25-44 and 45-64 age groups had the highest case rates at 8.6 per 1,000 and 8.5 per 1,000 respectively in the past week.

For the 0-4 age group, case rates in the Northern region decreased by 2.9%, Te Manawa Taki decreased by 21.6%, Central increased by 8.7% and Southern increased by 4.1% in the past week.

For the 5-14 age group, case rates in the Northern region decreased by 1.2%, Te Manawa Taki decreased by 26.7%, Central decreased by 9.5% and Southern increased by 9.9% in the past week.

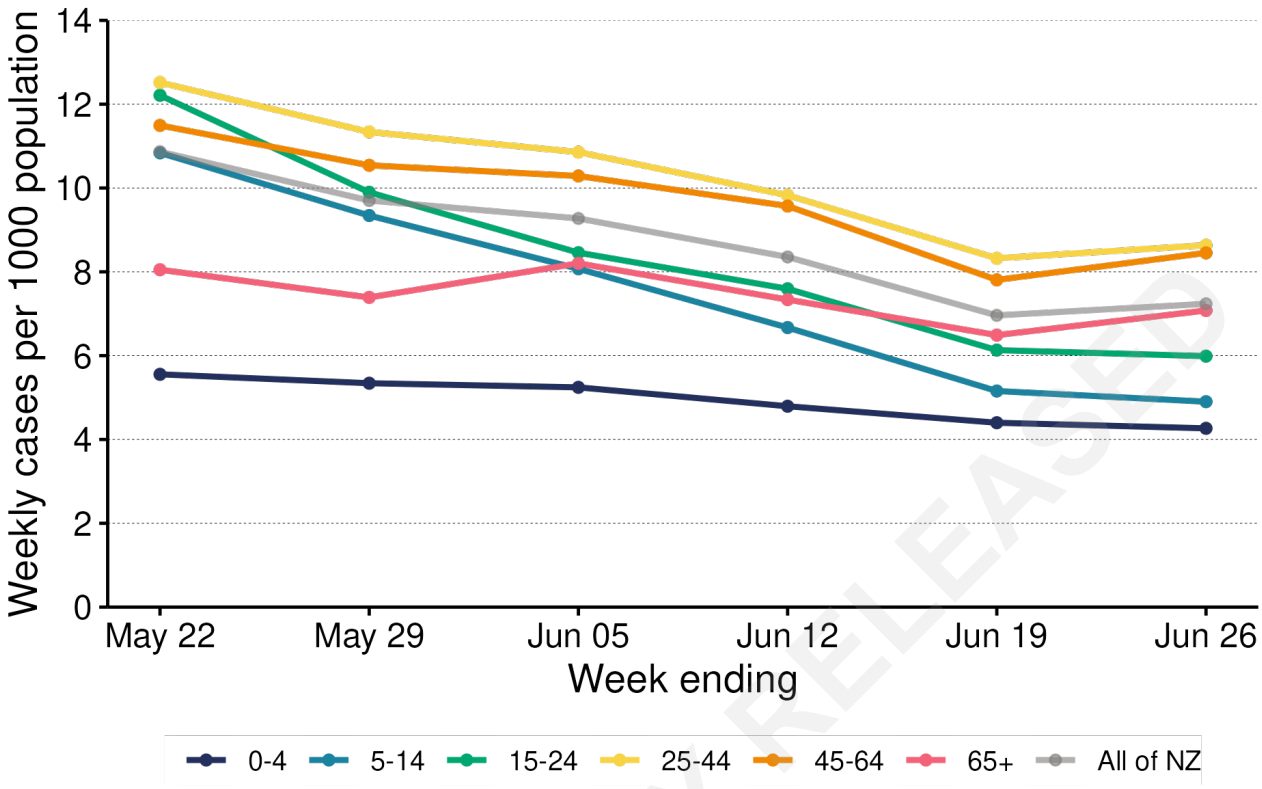
For the 15-24 age group, case rates in the Northern region increased by 3.8%, Te Manawa Taki decreased by 15.1%, Central decreased by 17.3% and Southern increased by 9.0% in the past week.

For the 25-44 age group, case rates in the Northern region increased by 1.7%, Te Manawa Taki decreased by 9.1%, Central increased by 7.5% and Southern increased by 13.6% in the past week.

For the 45-64 age group, case rates in the Northern region increased by 15.9%, Te Manawa Taki decreased by 0.3%, Central increased by 9.2% and Southern increased by 8.7% in the past week.

For the 65+ age group, case rates in the Northern region increased by 14.8%, Te Manawa Taki increased by 28.0%, Central increased by 7.8% and Southern increased by 0.4% in the past week.

Figure 12: National weekly case rates by age for weeks 22 May – 26 June 2022



Source: NCTS/EpiSurv as at 2359hrs 26 June 2022

Deprivation trends over time, by ethnicity and by region

Figure 13 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 (9.2 per 1,000 population),** followed by areas of mid-range deprivation (7.7 per 1,000) and areas most deprived (5.0 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 followed by Asian ethnicity (6.8 and 6.4 per 1,000 respectively). Cases in Pacific Peoples were the lowest in areas most deprived (2.3 per 1,000) and the highest in areas least deprived (5.4 per 1,000). European or Other had the highest case rates in areas least deprived at 9.7 per 1,000 followed by Asian (8.0 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 7%, for Asian 17% and for European and Other, 58%. Following this, 81% of cases in areas of least deprivation were European and Other compared with 12% Asian, 5% Māori and 1% Pacific Peoples.

In the Northern region, case rates were highest in the least deprived areas (7.9 per 1,000 population) followed by areas of mid-range deprivation (7.1 per 1,000) and areas most deprived (4.1 per 1,000).

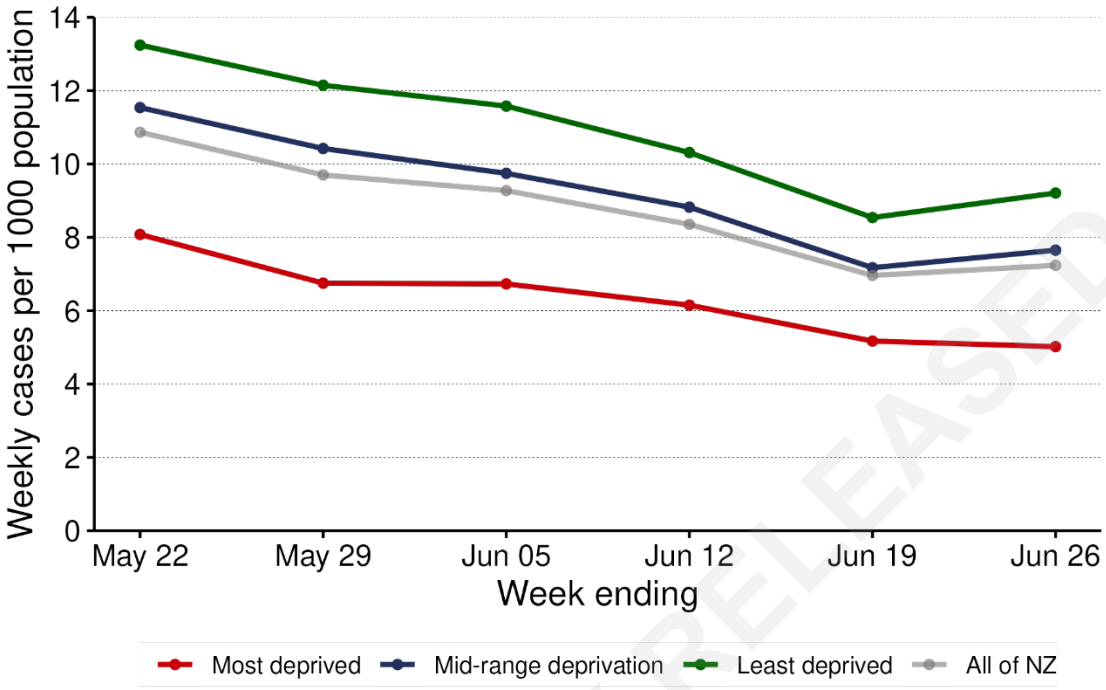
In Te Manawa Taki region, case rates were highest in the least deprived areas (7.0 per 1,000) followed by areas of mid-range deprivation (5.8 per 1,000) and areas most deprived (4.1 per 1,000).

In the Central region, case rates were highest in the least deprived areas (10.8 per 1,000) followed by areas of mid-range deprivation (8.5 per 1,000) and areas most deprived (5.3 per 1,000).

In the Southern region, case rates were highest in the least deprived areas (11.0 per 1,000) followed by areas of mid-range deprivation (9.6 per 1,000) and areas most deprived (8.2 per 1,000).

[5] Contents (otago.ac.nz)

Figure 13: National weekly COVID-19 case rates by deprivation status for weeks 22 May – 26 June 2022



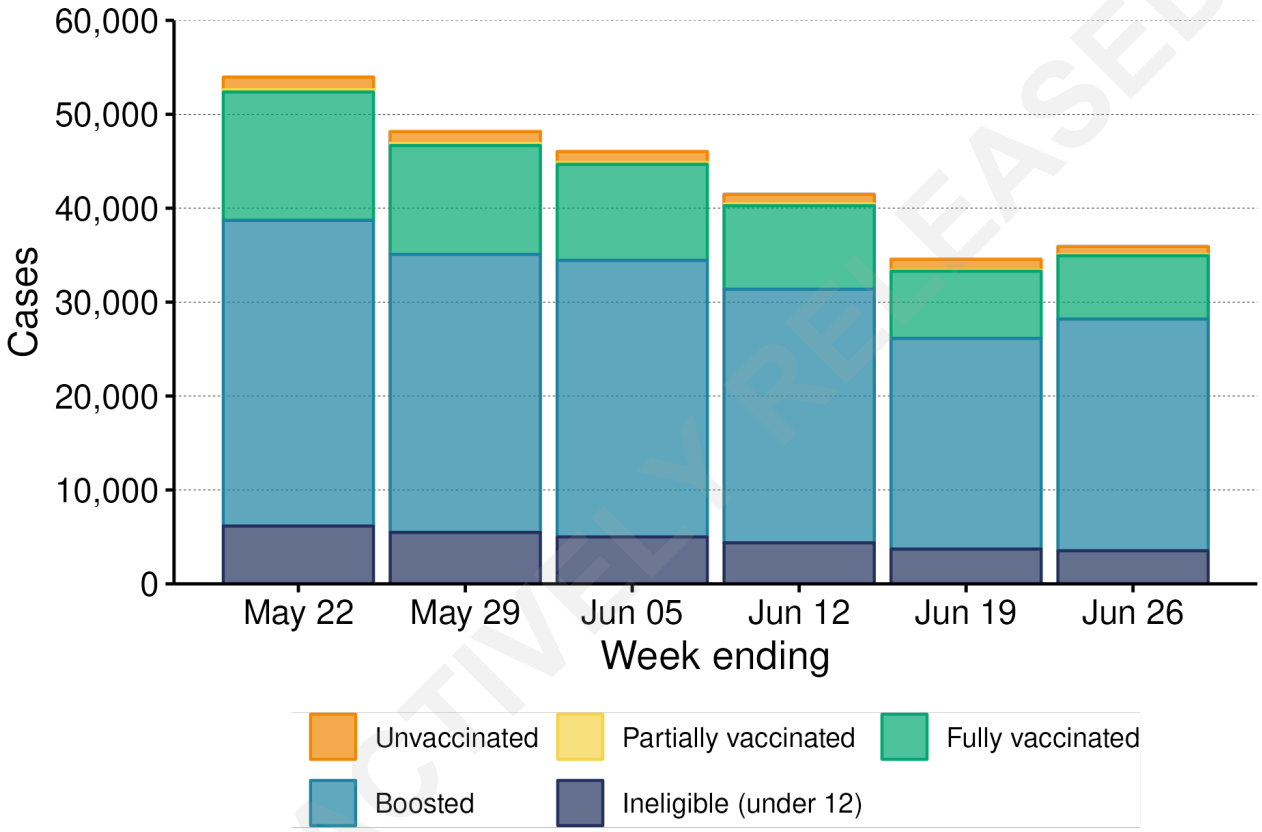
Source: NCTS/EpiSurv as at 2359hrs 26 June 2022

Vaccination trends over time

Figure 14 shows community case numbers by vaccination status nationally. In the week ending 26 June, the proportion of boosted cases was 68.7% of all cases, while the proportion reported as fully vaccinated was 18.8% of all cases.

The proportion of cases amongst those who are categorised as ineligible due to being under 12 years old[6] was 9.8%. The proportion of cases reported as partially vaccinated remains constant at 0.4%, while cases reported in those unvaccinated were below the week prior at 2.4%.

Figure 14: National weekly case numbers by vaccination status for weeks 22 May – 26 June 2022



Source: NCTS/EpiSurv as at 2359hrs 26 June 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

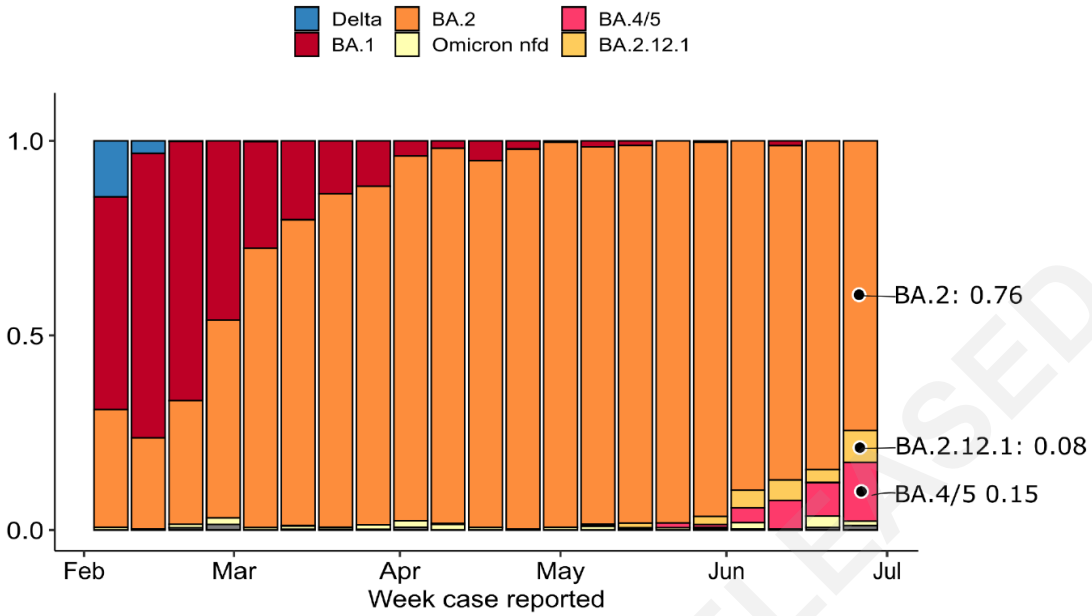
This week, all three watchlist variants (BA.2.12.1, BA.4 and BA.5) were again detected in community samples (first detected in late May/early June) with increasing frequency. Wastewater data also continues to detect BA.4/5 and BA.2.12.1 at a number of sites. Wastewater data coupled with community case WGS results strongly suggest that BA.4/5 and BA.2.12.1 are circulating within the wider NZ population. The upward rise of the BA.4/5 variants of Omicron is a key observation – it now makes up approximately 10% of community cases in the past fortnight. **ESR estimates that BA.5 will likely become the dominant variant around mid-July, and 90% of cases in early August.** Separate work by the COVID-19 Modelling Aotearoa group is considering how this may translate into case numbers.

Figure 15 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 76% of sequenced community cases in the past week. **Figure 15 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 around mid-July.

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

Figure 15: ***Frequency of Variants of Concern in community cases in New Zealand***



Source: ESR COVID-19 Genomics Insights Report #12, EpiSurv/Microreact 0900hrs 27 June 2022

Border Surveillance

Cases detected at the Air Border

Imported cases initially increased as travel volumes increased after border reopening in March. Since May, detected cases have remained at roughly constant levels from week to week, until the end of pre-departure tests requirements.

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.

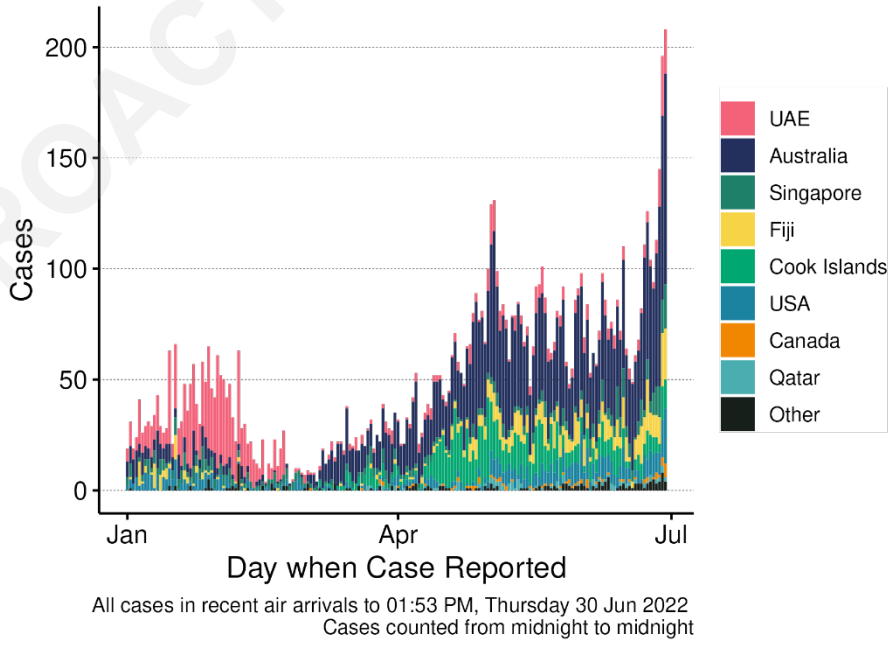
Figure 16 shows the number of RAT-positive cases in arrivals since January 2022. Before Reconnecting New Zealand dropped most of the quarantine requirements, most active cases were on the long-haul flights via the UAE. From then until 19 June, while pre-departure tests were required, most cases arrived 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 USA 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.

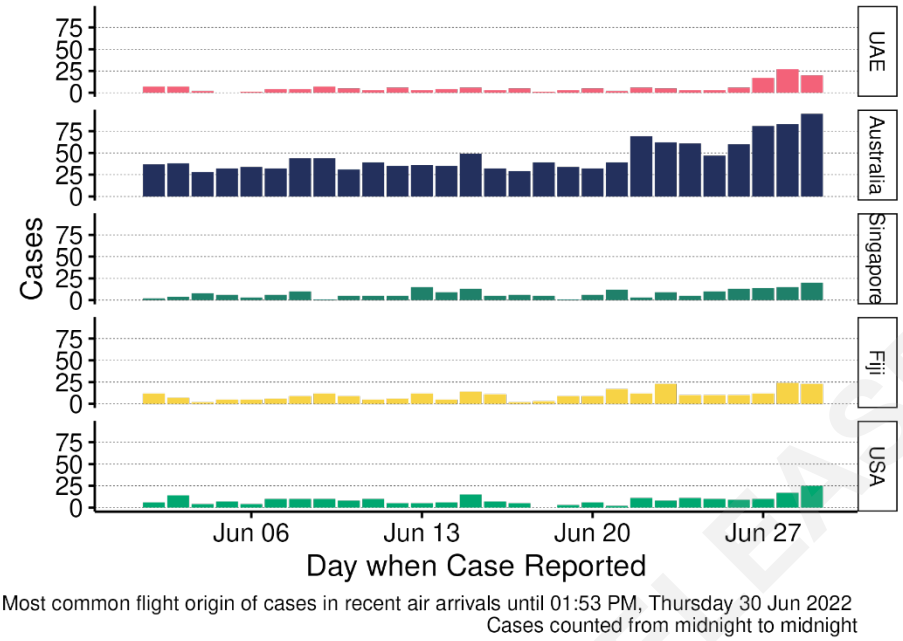
While the increase is rapid, it is in line with expectations for the removal of pre-departure testing. Even with this increase, there are many fewer cases detected at the border than are reported each day in the community.

Figure 16: Cases reported in post-arrival testing by country of flight departure, 01 January – 29 June 2022



Source: NCTS/EpiSurv as at 2359hrs 29 June 2022

Figure 17: Cases reported in post-arrival testing, by the five flight-departure countries with most cases reported in the seven days to 29 June 2022

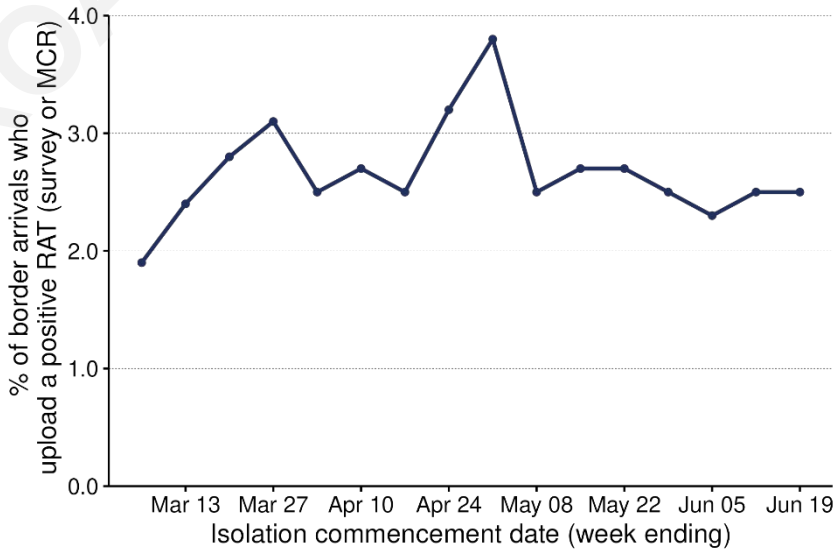


Testing of Border Arrivals

Figure 18 shows that the percentage of positive RATs in border arrivals who reported a test was mostly between 2 - 4% for the period 06 March – 19 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 has been holding **steady between 2% and 3%.** In the week ending 19 June, 1,043 of 41,657 arrivals returned a positive RAT, of which 386 were reported through the border survey and the rest through My COVID Record.

Rates per traveller may be rising since 20 June, when pre-departure tests were no longer required. Rates are likely to rise next week as more day 5 tests from recent arrivals are reported.

Figure 18: Percentage of positive tests in border arrivals who report RATs, 06 March – 26 June 2022



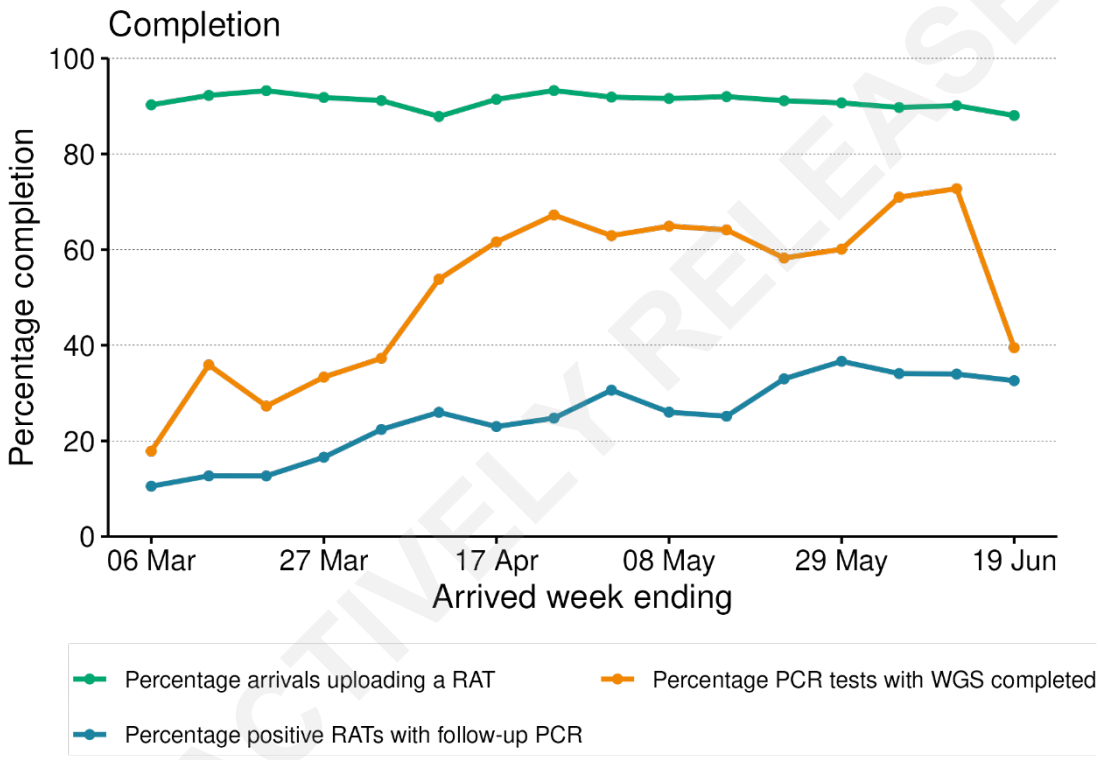
Sources: NCTS/EpiSurv/Éclair as at 2359hrs 30 June 2022

Whole Genomic Sequencing of Imported cases

Figure 19 shows the completion metrics for border returnee testing and WGS from 7 March to 19 June 2022. The percentage of arrivals uploading a RAT has been constant with an average of 90%. In the week ending 19 June, there were 41,657 border arrivals, of whom 88.0% (36,678) uploaded a RAT result upon arrival. This is a slight decrease from 90.1% 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 19: Completion metrics for border returnee testing and WGS for arrivals, 06 March – 19 June 2022



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 19 June 2022, ESR WGS 19 June 2022[7]

Figure 20 shows the border returnee testing and WGS metrics for arrivals. In the week ending 19 June, **32.6% of border arrivals who returned a positive RAT had a follow-up PCR test**. This is a slight decrease compared to 34.0% the week prior.

In the week ending 19 June, the percentage of PCR positive border arrivals with WGS complete was 39.5%. The figure will rise as more of the recent cases are processed: It is now 72.7% for the week ending 12 June and 71.0% for the week ending 5 June. Figure 20 shows that **enough PCR swabs are being sent to ESR** to meet the genomic surveillance target of 300 sequences a week.

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

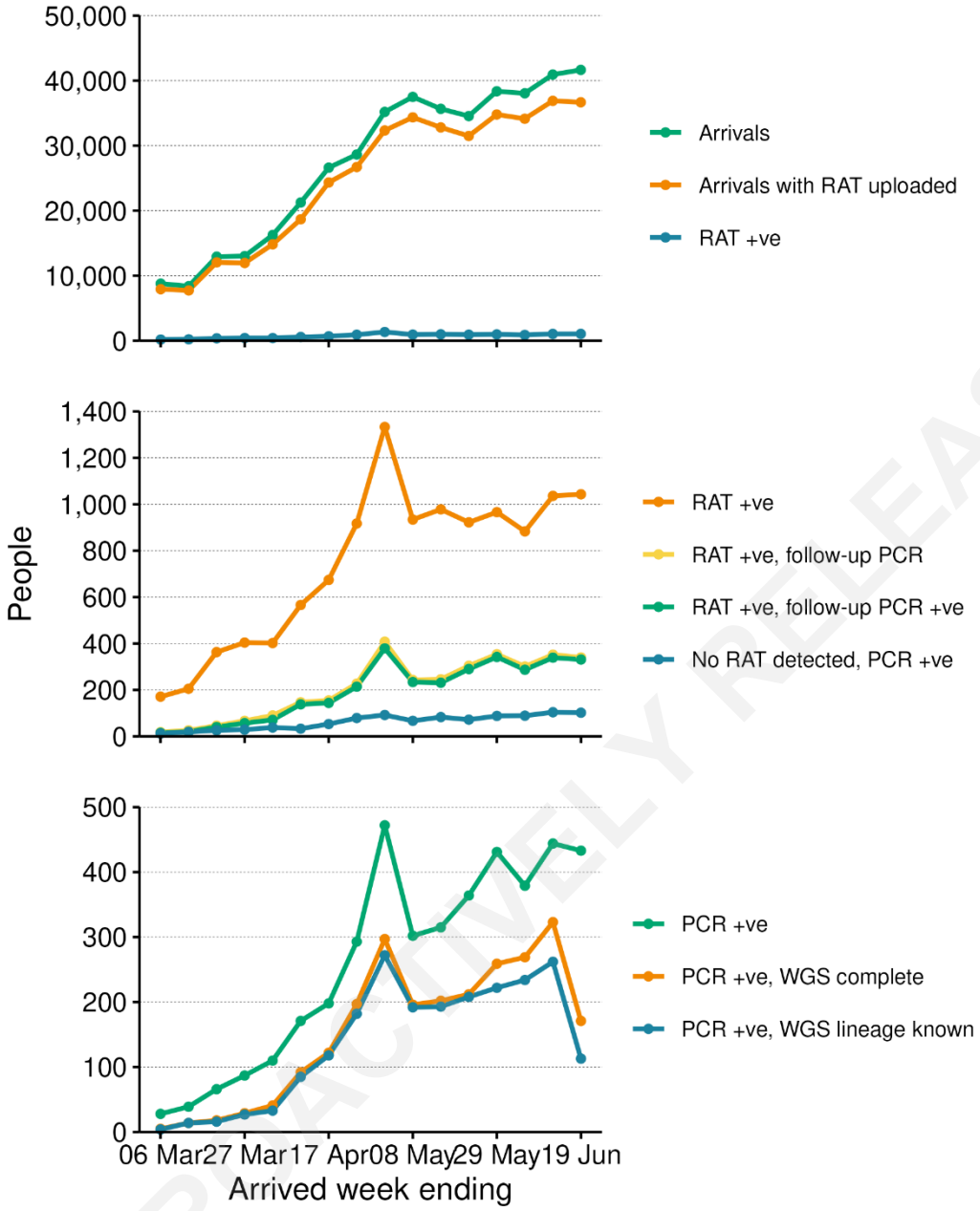
About half of the genomes sequenced at the border in the past fortnight are the watchlist variants; BA.4/5 or BA.2.12.1. As at 6:00pm 26 June, ESR had received samples from 419 of the 734 PCR-positive border cases with a report date in the two weeks to 24 June. Nineteen samples failed WGS and 107 have not yet been sequenced. Of the successfully sequenced samples, 44% were BA.2, 9% were BA.2.12.1, 9% were BA.4, 20% were BA.5, and 18% 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.

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 20: Border returnee testing and WGS metrics for arrivals, 06 March – 19 June 2022



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

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

Hospitalisation and Mortality

Hospitalisation Rates

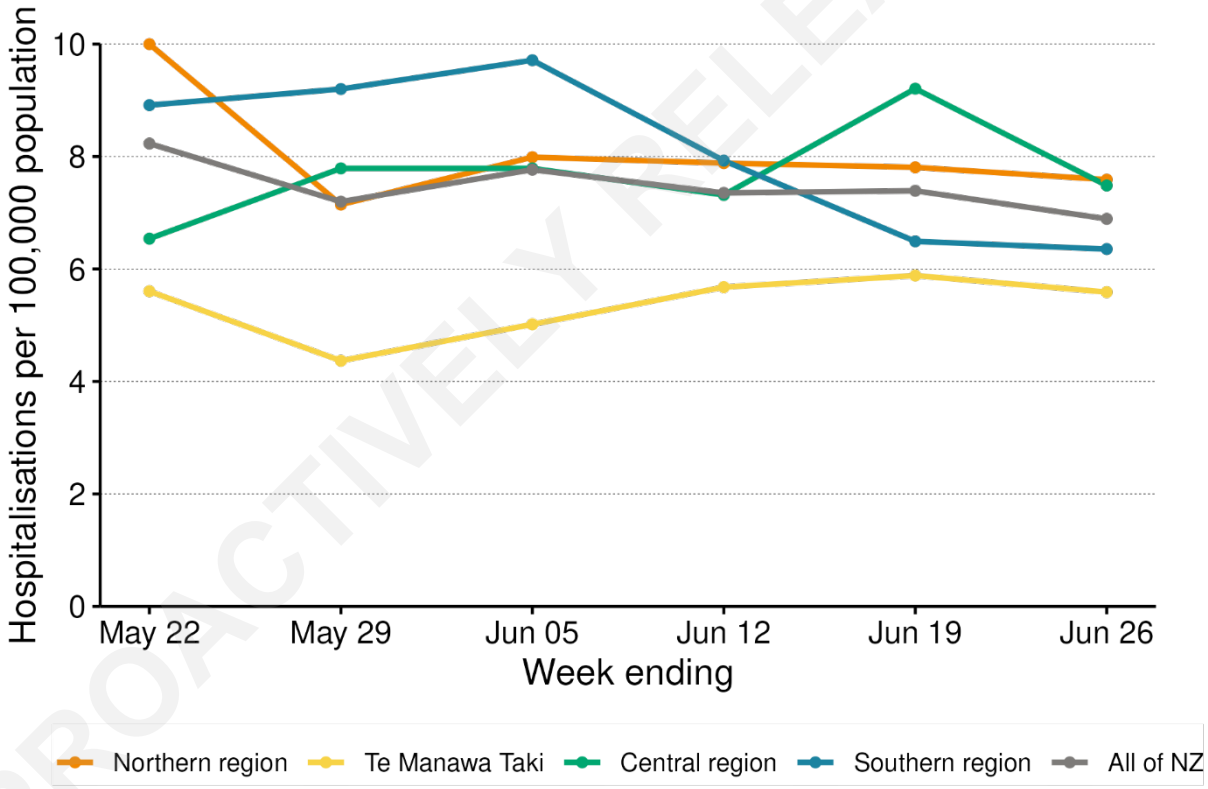
Due to varying definitions of an active case, there may be regional differences in the coding of COVID-19 infection status for hospitalisations.

Hospital Occupancy

For the week ending 26 June, the national hospital occupancy rate was 6.9 per 100,000 population, a decrease of 6.8% from the week prior **(Figure 21)**.

Hospital occupancy rates decreased across all regions in the past week. The Northern region (7.6 per 100,000) decreased by 2.8%, Te Manawa Taki (5.6 per 100,000) decreased by 5.0%, Central region (7.5 per 100,000) decreased by 18.7% in the past week, and Southern (6.4 per 100,000) decreased by 2.1%.

Figure 21: Regional weekly hospital occupancy rate per 100,000 population, 22 May – 26 June 2022



Source: Daily hospital questionnaire as of 26 June 2022

Whole Genomic Sequencing of hospitalised cases

As of 26 June, ESR received samples from and had processed 63 of the 300 PCR positive hospital cases with a report date in the two weeks to 24 June 2022. Of these, 65% had a BA.2 genome, 1% were BA.2.12.1, 6% were BA.5 and 22% were Omicron unassigned.

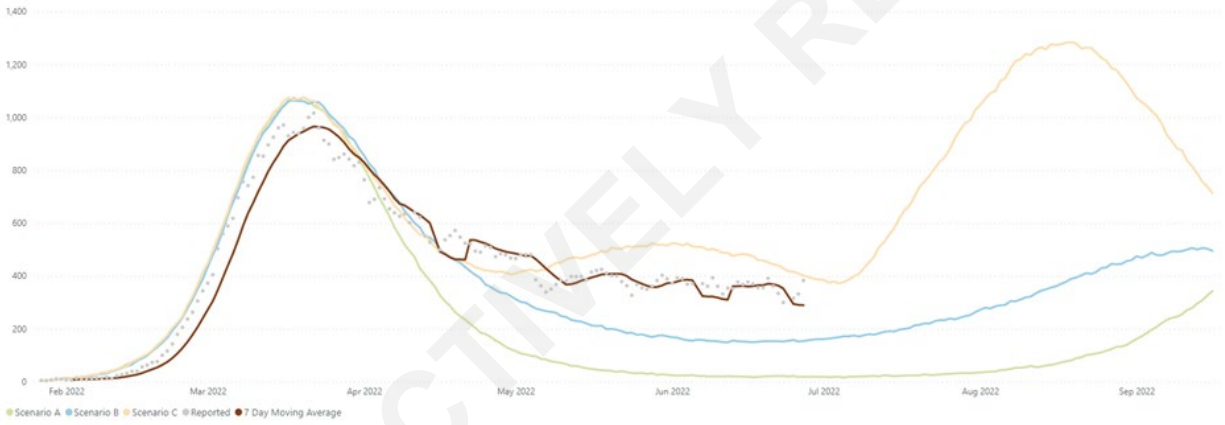
ESR receives a daily list of active COVID-19 cases who tested positive in the past 14 days and were hospitalised in the past 7 days. ESR is working with the Ministry of Health to receive information indicating which cases have been admitted to ICU or HDU.

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 22**).

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.

Figure 22: 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 27 June 2022.

Mortality

Figure 23 shows the 7-day rolling average of deaths by date of death, which was 11 as of 26 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 24 shows **COVID-19 related deaths by cause over time**. From March 2020 to 26 June 2022, there were 1,451 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, 639 **(50%) were determined to have COVID-19 as the main underlying cause**. COVID-19 contributed to a further 347 deaths (27%). Another 286 people died of a separate, unrelated cause (22%).

Figure 25 shows mortality by age and ethnicity from 1 March to 19 June 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 15.9 per 1,000 population. **The mortality rate for those aged 80-89 is 4.0 per 1,000**; and for those aged 70-79 is 1.0 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).

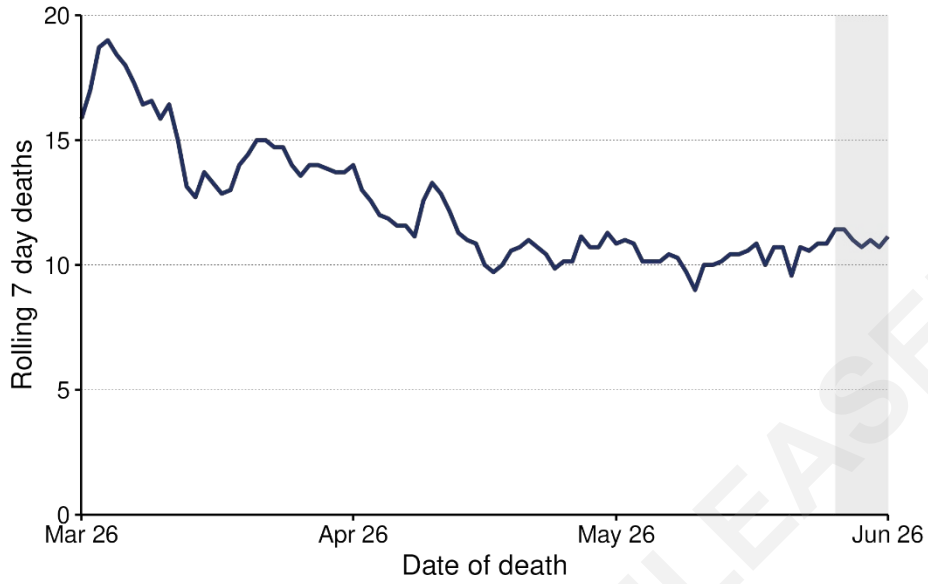
Across age groups, **Pacific and Māori have consistently higher mortality than Asian and European or Other** ethnicities. However**,** these age-stratified deaths by ethnicity are based on small numbers of events meaning that some rates have wide confidence intervals (CI)[9] and are not statistically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

Of people aged 90+, Pacific Peoples had the highest mortality rate at 58.4 per 1,000 population (95% CI 32.7 – 96.3 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 16.1 per 1,000 population (95% CI 11.8 – 21.5), while Asian was again the lowest at 2.3 per 1,000 (95% CI 1.3 – 3.6).

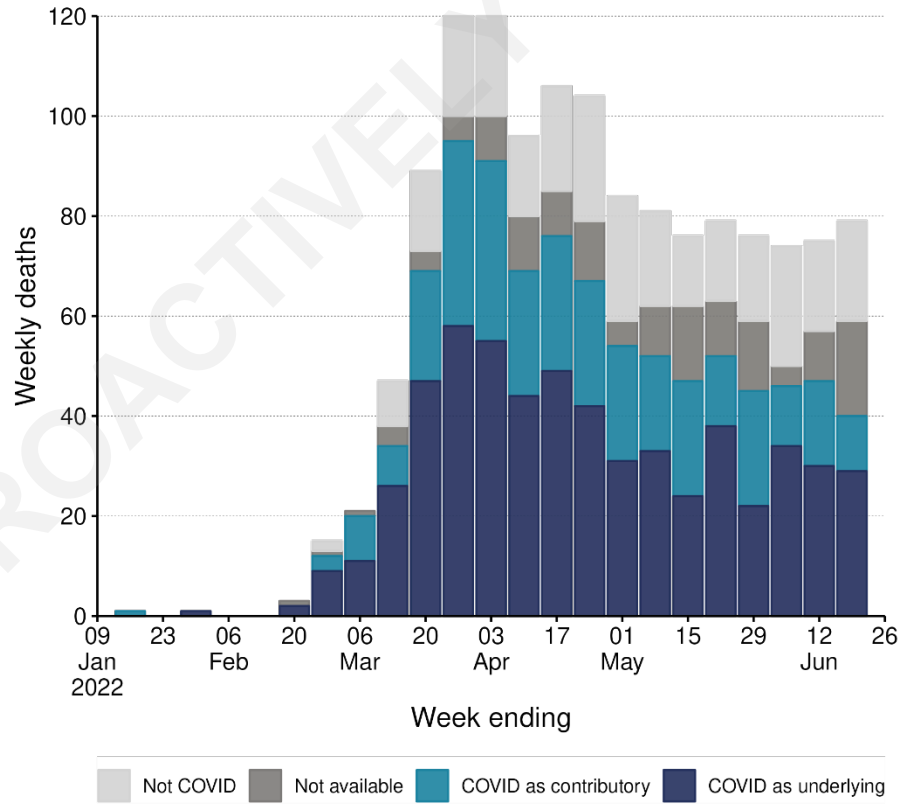
[9] *Mortality data, even based on complete counts, may be affected by random variation—that is, the number of deaths that actually occurred may be considered as one of a large series of possible results that could have arisen under the same circumstances. When the number of deaths is small, perhaps 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 23: 7-day rolling average of deaths within 28 days of being reported as a COVID-19 case, by date of death, 26 March – 26 June 2022



Source: NCTS/EpiSurv as of 26 June 2022[10]

Figure 24: Deaths by cause, 01 January – 26 June 2022



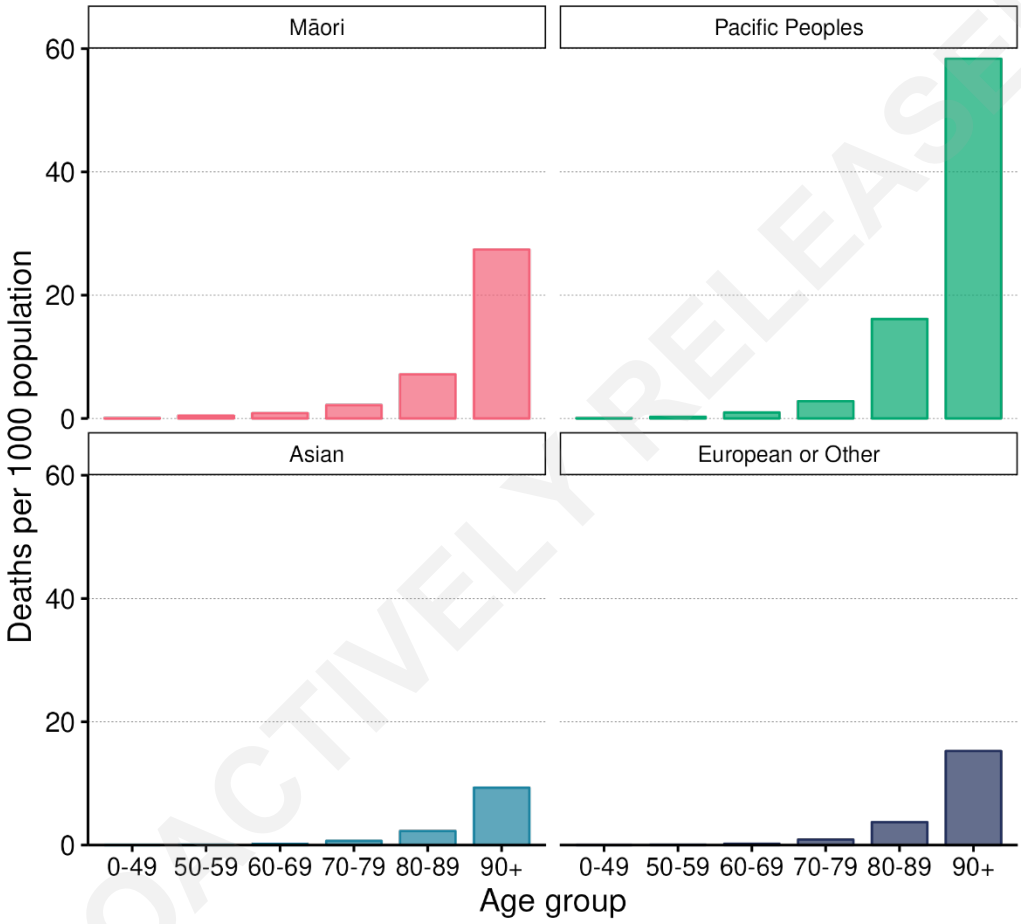
Source: Ministry of Health, all 2022 deaths by date of death within 28 days of report as COVID-19 case, and all other 2022 deaths where COVID-19 was the underlying or a contributory cause

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

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



Source: NCTS/EpiSurv as of 26 June 2022

All cause death rates

Details 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 has increased for the third consecutive week after a declining trend since the last peak in March 2022. In the week ending 26 June 2022, over 4.1 million cases were reported, an 18% increase compared to the previous week. The number of new weekly deaths increased by 13% compared to the previous week, with over 8,500 fatalities reported.

At the regional level, the number of new weekly cases increased in the Eastern Mediterranean Region (+47%), the European Region (+33%), the South-East Asia Region (+32%), and the Region of the Americas (+14%), while it decreased in the African Region (-39%) and the Western Pacific Region (-3%). The number of new weekly deaths increased in the Eastern Mediterranean Region (+22%), the South-East Asia Region (+15%), and the Region of the Americas (+11%), while decreases were observed in the Western Pacific Region (-6%), the European Region (-5%) and the African Region (-1%). As of 26 June 2022, over 541 million confirmed cases and over 6.3 million deaths have been reported globally.

There continues to be a decline in the number of SARS-CoV-2 sequences submitted to GISAID, as compared to January 2022 when 1,248,906 sequences were submitted. From 27 May to 27 June 2022, 146,183 SARS-CoV-2 sequences were submitted to GISAID. Among these sequences, the Omicron VOC remains the dominant variant circulating globally, accounting for 94% of sequences reported in the past 30 days. In the week ending 19 June 2022, BA.2 represented 25% among Omicron sequences, while BA.2.12.1 represented 11%, BA.4 represented 12%, and BA.5 represented 43%. Comparing the proportion of Omicron sequences submitted during the week ending 12 June and 19 June, BA.2 declined from 30% to 25%, BA.2.12.1 declined from 18% to 11%, while BA.4 increased from 9% to 12% and BA.5 increased from 28% to 43%.

As of 22 June 2022, 33 countries in five WHO Regions have reported 920 probable cases of severe acute hepatitis of unknown aetiology in children. Since 27 May 2022, 270 new probable cases have been reported to WHO, including from four new countries. Of the probable cases, 45 (5%) children have required transplants, and 18 (2%) deaths have been reported to WHO. While the aetiology remains uncertain, one study has investigated the possibility that persistent gastrointestinal infection with COVID-19 is linked to immunological hepatic damage.[11]

Australia

New COVID-19 cases in Australia have increased slightly as of 28 June, with a 7-day rolling average of 28,408, an increase of 4.4% in the past two weeks. The 7-day rolling average of daily deaths increased by 10% in the same period.

[11] Severe acute hepatitis in children: investigate SARS-CoV-2 superantigens

At the state level, new cases in New South Wales and Victoria have been increasing since mid-June. As of 30 June, the 7-day rolling average of new cases increased by 39% from the two weeks prior. New cases in Victoria have gradually risen in the past two weeks. The 7-day rolling average of reported cases was 7,850, an increase of 18% in the same period.

As of 30 June, the 7-day rolling average of patients in hospital for New South Wales increased by 16% in the past two weeks while in Victoria, this number decreased by 4%. The number of deaths in New South Wales has increased by 64% in the past two weeks, with the 7-day rolling average of deaths (18) at its highest point since mid-February. In Victoria, the 7-day rolling average of deaths has decreased by 16% in the same period.

The Victorian Department of Health has reported that the prevalence of BA.4 and BA.5 in Victorian metropolitan and regional wastewater catchments has risen significantly in recent weeks. The BA.4 and BA.5 subvariants are expected to overtake BA.2 in the coming weeks to become the dominant strain in Victoria. This is in line with similar patterns observed in New South Wales and Queensland.

In the week ending 27 June, BA.2 represented 56% of Omicron sequences submitted by Australia to GISAID, while BA.2.12.1 represented 5%, BA.4 represented 9%, and BA.5 represented 30%.

European Union

European Union countries approved extending the use of COVID-19 certificates by one year until the end of June 2023 as reported cases start to increase ahead of the summer holiday season. The European Council said the regulation can be lifted earlier than July. However, while most EU countries removed COVID-19 restrictions over the past months, a recent increase in infections, likely caused by the increasing prevalence of BA.4 and BA.5, is leading governments to rethink their strategies.

Germany

New COVID-19 cases in Germany have been steadily climbing since mid-June. As of 28 June, the 7-day rolling average was 84,852, an increase of 40% in the past two weeks.

In the week ending 27 June, BA.2 represented 29%, while BA.2.12.1 represented 6%, BA.4 represented 7%, and BA.5 represented 58% among Omicron sequences submitted to GISAID.

France

New COVID-19 cases in France have been steadily climbing since mid-June and are now following a similar increasing trend to that observed in Germany in the past week. As of 28 June, the 7-day rolling average of new cases was 78,465, an increase of 103% in the past two weeks.

In the week ending 27 June, BA.2 represented 25%, while BA.2.12.1 represented 0%, BA.4 represented 21% and BA.5 represented 54% among Omicron sequences submitted to GISAID.

Ireland

As of 29 June 2022, Ireland reported 776 patients in hospital, a 23% increase of those reported a week prior. It is likely that the BA.4 and BA.5 subvariants are contributing to a rise in hospitalisations observed over the past month, an increase of 306% between 01 June and 29 June.

In the week ending 27 June, BA.2 represented 15%, while BA.2.12.1 represented 17%, BA.4 represented 15%, and BA.5 represented 53% among Omicron sequences submitted to GISAID.

Italy

New COVID-19 cases in Italy have risen steadily since the beginning of June. As of 28 June, the 7 day rolling average of new cases was 58,870, a 156% increase in the past two weeks.

In the week ending 27 June, BA.2 represented 38%, while BA.2.12.1 represented 3%, BA.4 represented 21%, and BA.5 represented 38% among Omicron sequences submitted to GISAID.

Portugal

New COVID-19 cases in Portugal are beginning to decline, after experiencing an increasing trend likely driven by the BA.5 variant since early May. As of 28 June, the 7 day rolling average of new cases was 10,530, a decrease of 47% in the past two weeks. Daily deaths have also decreased, with the 7 day rolling average of daily deaths decreasing by 54% over the same period.

Excess mortality data for Portugal is only available up to 05 June when it was 10.95% above the projected number of deaths for the same period based on previous years.

In the week ending 13 June, BA.2 represented 14%, while BA.2.12.1 represented 0%, BA.4 represented 0%, and BA.5 represented 86% among Omicron sequences submitted to GISAID.

United Kingdom

The latest Office for National Statistics (ONS) infection survey shows infection rates have increased in all four UK countries.[12] Scotland saw the largest weekly increase in the proportion of its population testing positive for COVID-19 out of the UK countries, with its positivity increasing from 1% to 3.36%. Infections increased in all age groups and across all regions in England except the North-East. Growing prevalence of BA.4 and BA.5 variants are thought to be responsible for the increases.

BA.4 and BA.5 are now dominant in the UK and COVID-19 incidence is increasing. Updated modelling shows that BA.4 and BA.5 continue to demonstrate a growth advantage over BA.2 with a relatively high degree of certainty. The relative growth advantage for BA.5 is larger than BA.4 and it is likely that BA.5 will become the dominant variant in the UK. The UKHSA estimates that 22.28% (CI: 16.25 to 28.77) and 39.46% (CI: 32.19 to 51.31) of cases are currently BA.4 and BA.5, respectively.[13]

In response to the new wave of COVID-19 infections seen in the UK, the Welsh Government has decided to extend the availability of free lateral flow tests for another month. The Government also adjusted the R range for England from 1.1 to 1.4 on 24 June, with the growth rate range for COVID-19 infection in England estimated as +2% to +5% per day.

In the week ending 26 June, England reported 7,912 patients admitted to hospital, a 38% increase from the week prior. After removing the requirement for masks in early June, NHS England have reintroduced the requirement for face masks to be worn in wards. As of 28 June, there were 8,120 patients currently in hospital with 205 in ventilation beds.

[12] ONS Survey

[13] UKHSA's COVID-19 variant technical briefing 43

USA

New COVID-19 cases in the United States have plateaued, with a 7-day rolling average of 108,000 new cases as of 28 June, an increase of 4.5% in the past two weeks. Daily deaths have also plateaued, with the 7-day rolling average of deaths increasing by just 1% over the same period.

In the week ending 27 June 2022, the 7-day rolling average of daily hospital admissions (4,916) increased by 12.9% compared to the week prior (4,356). This number has been trending upwards since 06 April 2022, when the United States reported a 7-day rolling average of 1,422, their lowest since reporting began in August 2020.

CDC Nowcast projections for the week ending 25 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 42.0%; BA.5 is projected to be 36.6%; BA.4 is projected to be 15.7%; BA.2 is projected to be 5.7%.

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 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).
- 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 ≥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

Please note that the Ministry of Education information on teacher absences due to COVID19 used in the evidence brief has issues related to over-counting, data lags and quality that may have led to over-estimations of trends. In the coming weeks we expect to have a new source of information to report the impact of COVID on schoolteachers that provides a timelier and more comparable picture.

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 22 June 2022.

Figure 26: Omicron Health Sector Clinical Indicators Dashboard summary, week ending 22 June 2022

Sector	Summary of data
General Practice	National GPQED rates are currently 6.4% higher than at the same time last year. This is lower than the annual change measured last week. There have been sustained increases in GPQED rates for ages 10 – 49 years. Since early February 2022 rates for these age groups have been higher than in any of the previous 3 years.
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. 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.
Aged Residential Care	There has been an increase in the number of Aged Residential Care (ARC) facilities with COVID-19 cases from 125 facilities last week, to 146. In DHB regions where there are high case numbers impacting a single facility, DHBs have reported that these are often in dementia units where movement and interaction between residents can be more difficult to manage.
Pacific Health	Pacific providers across the motu continue to work on innovative ways to improve vaccination and reduce barriers to care.
Emergency Ambulance Service	There is continued pressure across the ambulance sector with elevated levels of demand and high incident cycle times. Delays at ED are a significant contributor to the prolonged cycle time.
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.
ED	ED presentations decreased very slightly over the past week from a 5 day rolling average of 4,040 ED presentations on 14th June to 3,829 on June 20th Across the motu there were slightly less incidences of ED occupancy over 90% than the previous week, however ED occupancy remains high. National SSED for all patients seen and treated in 6 hours in ED was 74% week ending June 19th (compared with 73% week ending June 5th)
Hospital	Hospitals continue to experience high occupancy, with Wellington, Hutt Valley, Tauranga, Rotorua and Palmerston North hospitals all being over 90% capacity at every census point this week. Acute patients with a Length of Stay (LOS) 7 days or over continue to increase across the motu and is the highest recorded at 1,467 patients currently in hospital for 7 days or more.
Planned Care (Hospital)	There continues to be fluctuations in the number of elective surgeries being completed across the motu due to staffing constraints, bed capacity and acute demand.
Pharmacy	Pharmacies continue to experience increased workforce pressures and absenteeism due to staff sickness (COVID-19 and influenza like illnesses).
Home and Community Services	We continue to see a reduction in total numbers of employees compared with Oct-Dec last year (9% decline) and a decline in total services delivered compared with Oct-Dec last year (4% decline), although total services delivered did increase in the last week.
Health Workforce	The Ministry continue to work with Immigration to streamline the immigration process for healthcare workers
Critical Care Workforce	The Critical Care workforce at Auckland City Hospital have seen increasing staff absences due to COVID-19 exposure or illness since June 10th. Other major centres are reporting little to no staffing absences due to COVID-19 exposure or illness
COVID care in the community	The percentage of cases contacted has **remained consistent** in the past four weeks and has **been constantly over 98%.** The 8-week trend shows consistent self-serve online contract tracing completion across all groups. The percentage of initial clinical assessments completed within 48 hours for Māori has increased significantly throughout the past week with completions each day increasing from 69.7% to 83.3%.

Sources: Omicron Health Sector Clinical Indicators Dashboard, 22 June 2022

Care in the Community

This section has been removed this week due to data issues.

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.