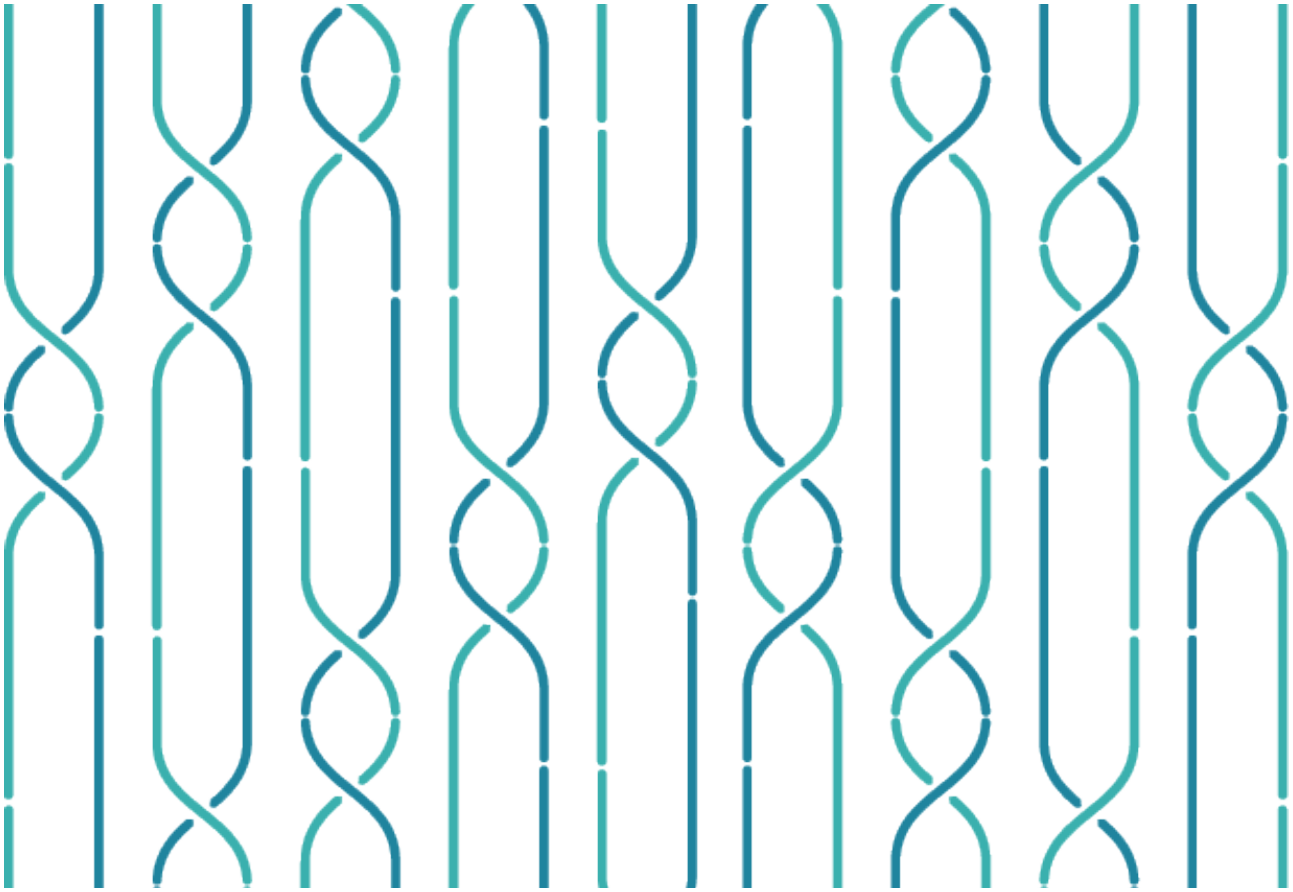
Te Kāwanatanga o Aotearoa
New Zealand Government

MANATŪ HAUORA
MINISTRY OF HEALTH

COVID-19 TRENDS AND INSIGHTS REPORT

09 December 2022



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MINISTRY OF HEALTH

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Purpose of report

This report comments on trends in the New Zealand COVID-19 outbreak, including cases, 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. An unknown proportion of infections are not reported as cases, this proportion may differ by characteristics such as ethnicity or deprivation group. Therefore, any differences in reported case rates must be interpreted with caution.

Executive summary

Overall, the key measures of infection (i.e. the levels of viral RNA in wastewater and reported case rates) used to monitor the COVID-19 epidemic show an increase in the past week. Case rates have increased; wastewater quantification of viral genomes has increased; hospital admissions and mortality have been relatively stable.

BA.5 was the dominant subvariant accounting for an estimated 44% of cases, with the proportion of BA.5 declining over the previous weeks. Detections of BA.2.75 and BQ.1.1 are trending upward, both in WGS and wastewater.

It is likely that cases, hospitalisations and mortality could increase over the next few weeks. However, the size, timing, and duration of the peak, as well as new baseline trends of cases, hospitalisations, and mortality are uncertain.

Key insights

National Trends

Cases	The 7-day rolling average of reported case rates was 94.1 per 100,000 population for the week ending 04 December. This was an increase from the previous week, which was 73.8 per 100,000. This week rates were highest in the 25-44 age group, followed by 45–64 (109.4 and 107.0 per 100,000, respectively). The proportion of cases that were reinfections has increased this week, making up 26% of cases.
Wastewater	Wastewater quantification of viral RNA has indicated an increase in infections in the past week.
Hospitalisations	The COVID-19 hospital admissions rate decreased substantially from mid-July, but then increased from early October to early November. However, in the week ending 27 November, the 7-day rolling average of hospital admissions was 1.3 per 100,000 population, which was similar to the previous week. The rate was highest in the 65+ age group (4.5 per 100,000).
Mortality	As of 04 December, there were 2,181 deaths attributed to COVID-19 in 2022. The weekly number of deaths attributed to COVID-19 declined substantially after peaking in early August, however, mortality has been higher in November than in October.
Variants of Concern	Prevalence of non-BA.5 variants continues to increase. BA.5 accounts for 44% of sequenced community cases seen in the week 12 November to 25 November, followed by BA.2.75 (32%), BQ.1.1 (15%), and XBC (4%). Wastewater variant analysis for the fortnight ending 25 November, reports the following proportions: BA.4/5 40%, BA.2.75 39%, BQ.1.1 12%, XBC 7% and XBB 3%.

Māori

Cases	The 7-day rolling average of age-standardised reported case rates has been increasing for the past four weeks to 77.4 per 100,000 population on 04 December, lower than for European or Other, however there may be case ascertainment biases. Rates were highest in those aged 45-64 (102.2 per 100,000)
Hospitalisations	The age-standardised cumulative hospital admission risk for 2022 was 1.8 times higher in Māori than European or Other. The 7-day rolling average to 27 November was 1.7 per 100,000 population and was highest for those aged 80+ (18.6 per 100,000).
Mortality	The age-standardised cumulative mortality rate for Māori was 1.9 times higher than European or Other in 2022.

Pacific peoples

Cases	The 7-day rolling average of age-standardised reported case rates have been increasing for the past four weeks to 95.4 per 100,000 population as at 04 December. Rates were highest in those aged 25-44 (134.4 per 100,000).
Hospitalisations	Pacific peoples have the highest age-standardised cumulative risk of hospital admission in 2022, 2.2 times higher than European or Other. The 7-day rolling average to 27 November was 1.6 per 100,000 and was highest in those aged 80+ (6.8 per 100,000)
Mortality	Pacific peoples have the highest age-standardised cumulative mortality risk of any ethnicity in 2022, 2.3 times that of European or Other.

International Insights

Globally, in the week ending 04 December, the number of new weekly cases remained stable (-3%) as compared to the previous week, with under 3 million new cases reported. The number of new weekly deaths decreased by 17% as compared to the previous week, with over 7,800 new fatalities reported.
BA.5 and its descendent lineages continued to be dominant globally, accounting for 70.1% of sequences submitted to GISAID in the week ending 20 November 2022. Proportions of BQ.1.1 and XBB and other subvariants of Omicron are increasing globally.
At the country level, the highest numbers of new weekly cases were reported from Japan (749,895 new cases; +7%), France (385,716 new cases; +38%), the Republic of Korea (370,574 new cases; -2%), the United States of America (296,333 new cases; -1%), and Brazil (188,043 new cases; +25%).
In Australia, in the 14 days to 02 December 2022, there were 671 new cases per 100,000 population. This is a 15% increase from the week prior (14 days to 25 November 2022) where there were 584 per 100,000 population.
China has started to ease COVID restriction (from 30 November) such as testing and COVID-19 requirements to access public transport and some public spaces. As of 05 December, Beijing, Shanghai, Zhengzhou and Shenzhen were among cities to end a requirement for negative test results in order to board public transport.

National summary of epidemic trends

Case trends

Evidence suggests the incidence in the community has increased in the past week. Both reported[1] case rates and levels of viral ribonucleic acid (RNA) in wastewater[2] have increased in the week to 04 December (see **Figure 1**). Based on combining wastewater data and reported cases, a preliminary estimate of case ascertainment rate (the proportion of infections reported as cases) is 44% (90% Uncertainty Interval: 0.36 to 0.53) for the fortnight to 27 November[3].

Please note, all modelling scenarios will be updated next week. Reported cases have been tracking above the modelled median that assumes 10 % higher transmission, since early October and have steadily increased over the past four weeks. However, in the week ending 27 November cases tracked below the modelled median rate. The updated model scenarios assuming a 10% increase in transmissibility caused by new variants, waning immunity, changes in masking and contact quarantine on 12 September, indicate that case rates are expected to increase (see **Figure 2**)[4]. The variant model is hypothetical but based on the properties of lineages recently reported overseas. **Figure 3** shows the national reported cases and the modelled scenario which assumes no new variant.

The reported case rate for the week ending 04 December was 94.1 per 100,000, a 27.5% increase compared to the previous week (73.8 per 100,000). Case rates increased in all regions; the rate was highest in Central region (103.4 per 100,000) and lowest in Te Manawa Taki (77.0 per 100,000) (See **Figure 4**).

Case rates across all age groups (under 5, 15-24, 25-44, 45-64, 65+) have increased compared to the week prior. The highest rates across all age groups were in those aged 25–44, 45-64 and +65 (109.4, 107.0, and 99.4 per 100,000, respectively). The lowest rates were among under 5 years and 5–14-year-olds (41.0 and 50.7 per 100,000, respectively) (see **Figure 5**).

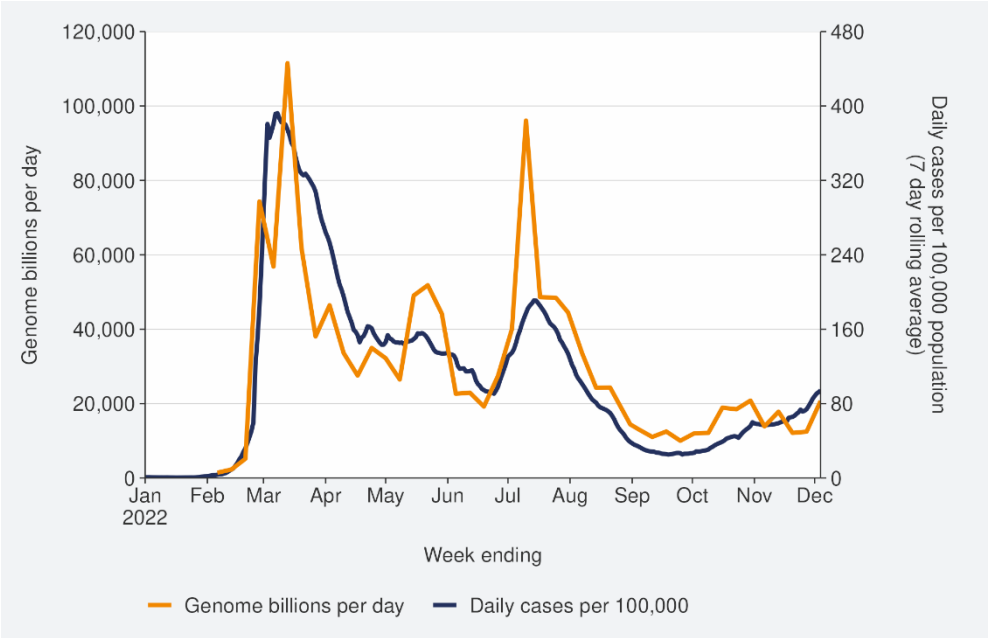
Table 1 of the appendix provides information on specific rates.

[1] Since 24 February 2022, most testing has been through self-administered rapid antigen tests (RATs) which require self-reporting of results. Therefore, it is likely that many infections are not detected or reported, and the proportion of infections reported ('reported cases') may differ by age, ethnicity, and deprivation.

[3] Case ascertainment has declined from peak ascertainment in March. Work is underway to provide estimates of the peak ascertainment and current ascertainment levels. The wastewater data has not yet been seasonal adjusted and therefore maybe subject to change depending on rainfall patterns across the motu.

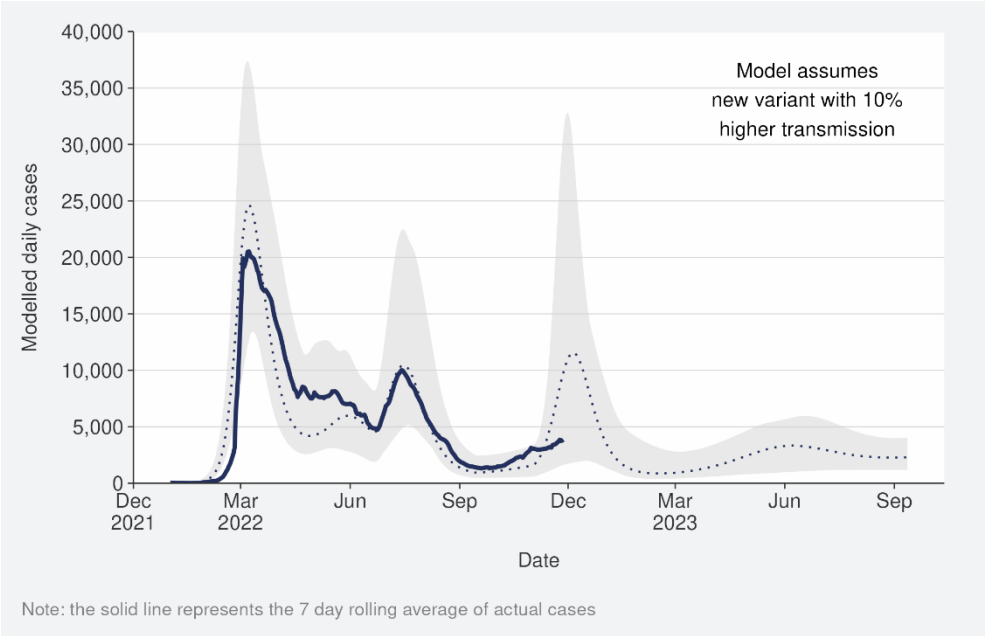
[4] See the online glossary for modelling assumptions.

Figure 1: National wastewater trends (SARS-CoV-2 genome copies)[5] and reported cases to 04 December 2022



Sources: ESR SARS-CoV-2 in wastewater update for week ending 04 December 2022 and NCTS/EpiSurv as at 2359hrs 04 December 2022

Figure 2: COVID-19 Modelling Aotearoa scenarios[6] compared with national reported case numbers with 10% higher transmission

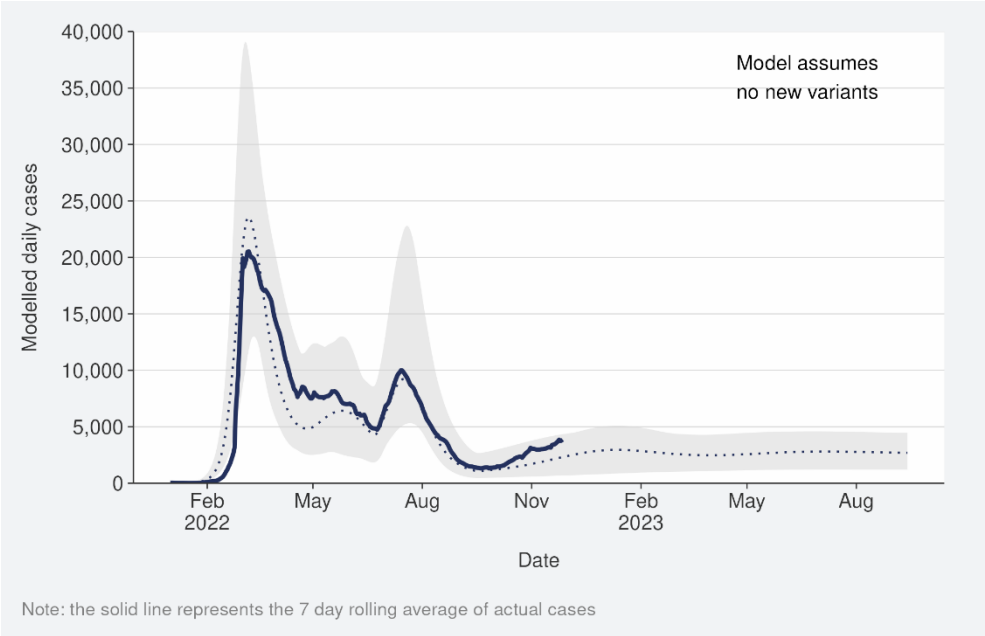


Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, October 2022, and NCTS/EpiSurv as at 2359hrs 27 November 2022

[5] Wastewater levels cannot be used to predict numbers of cases but do indicate trends in the infection rates.

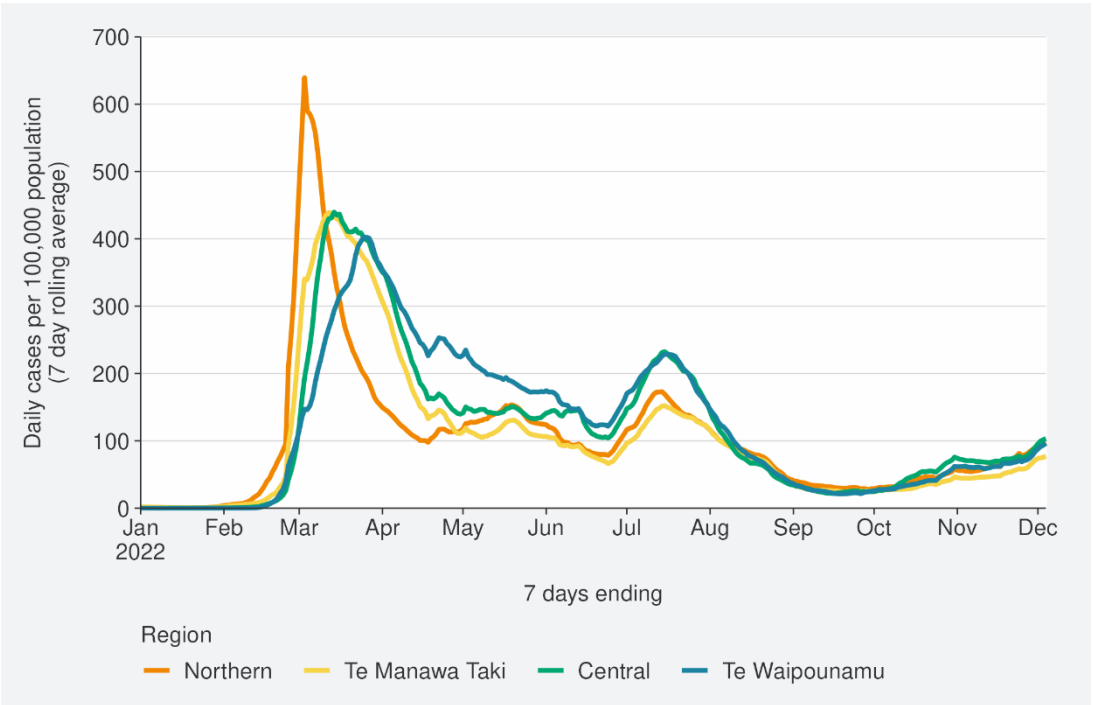
[6] The 'July' BA.5 scenario assumes that previous infection provides greater protection against reinfection and severe disease, this is consistent with emerging international evidence. It also incorporates updated data and future projections of uptake of second boosters, and an earlier transition to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

Figure 3: COVID-19 Modelling Aotearoa scenarios compared with national reported case numbers



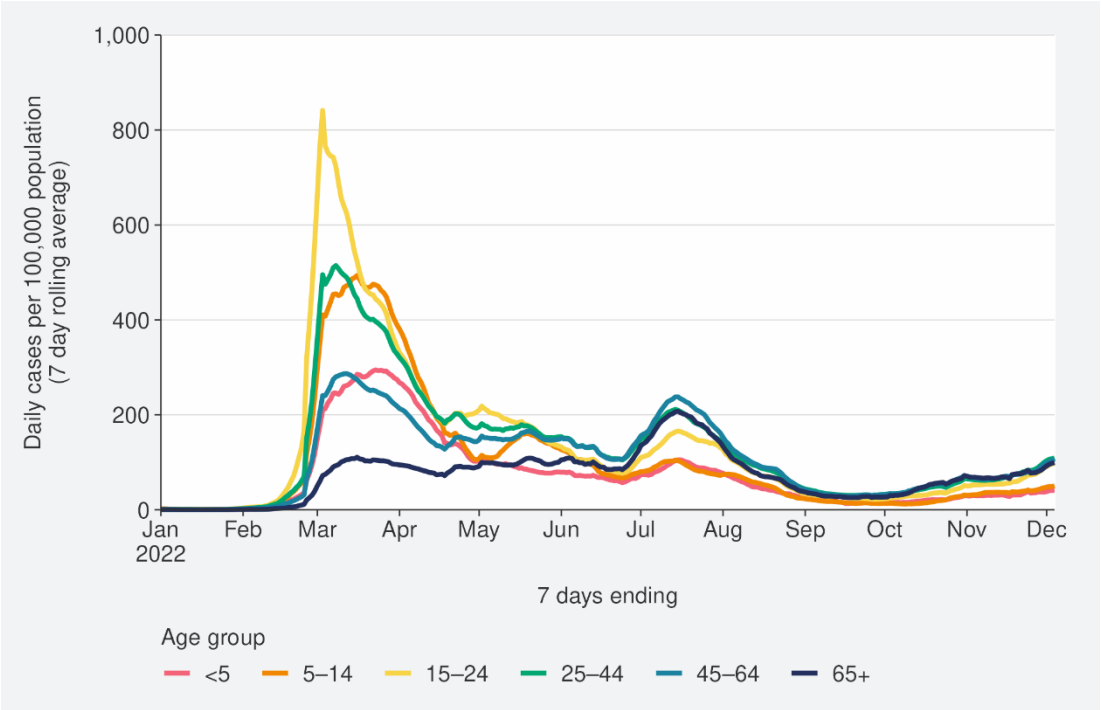
Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, October 2022, and NCTS/EpiSurv as at 2359hrs 27 November 2022

Figure 4: Regional reported case rates from 01 January to 04 December 2022



Source: NCTS/EpiSurv as at 2359hrs 04 December 2022

Figure 5: National reported case rates by age from 01 January to 04 December 2022



Source: NCTS/EpiSurv as at 2359hrs 04 December 2022

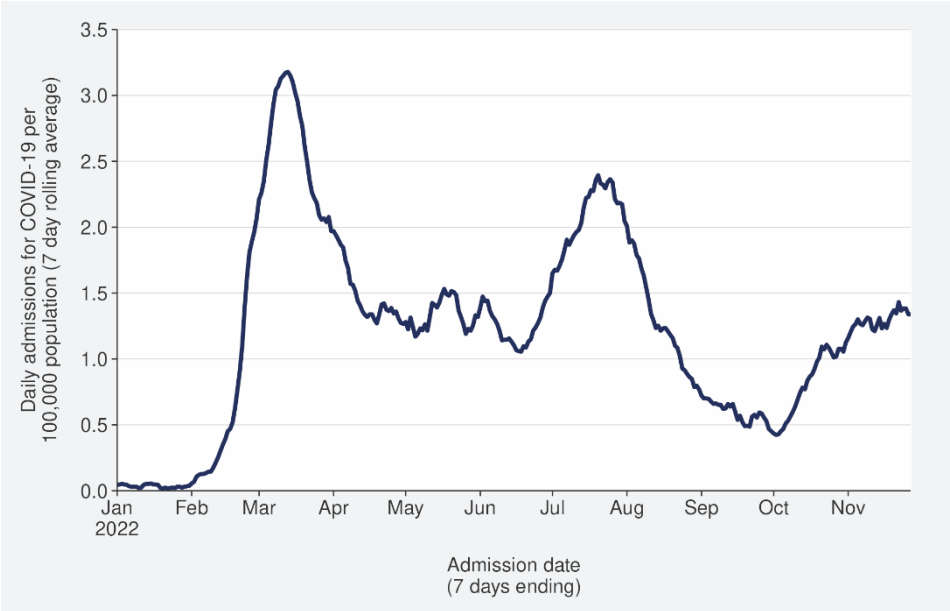
Hospitalisation and mortality trends

Hospitalisation

As seen in **Figure 6**, the national COVID-19 hospital admissions rate 'for' COVID-19 decreased substantially from mid-July but has increased since early October. Hospital admissions have been relatively stable since early November. In the week ending 27 November [7], the 7-day rolling average of hospital admissions was 1.3 per 100,000 population, similar to the previous week (1.4 per 100,000). The rate was highest in the 65+ age group (4.5 per 100,000).

Please note, all modelling scenarios will be updated next week. Modelling scenarios suggest current hospital admissions are tracking near the median range of the prediction and indicate admissions are expected to increase. The variant model is hypothetical but based on the properties of lineages recently reported overseas (**Figure 7**). **Figure 8** shows the national hospital admissions and the modelled scenario which assumed no new variant.

Figure 6: National[8] hospital admissions rate for COVID-19, 01 January to 27 November 2022

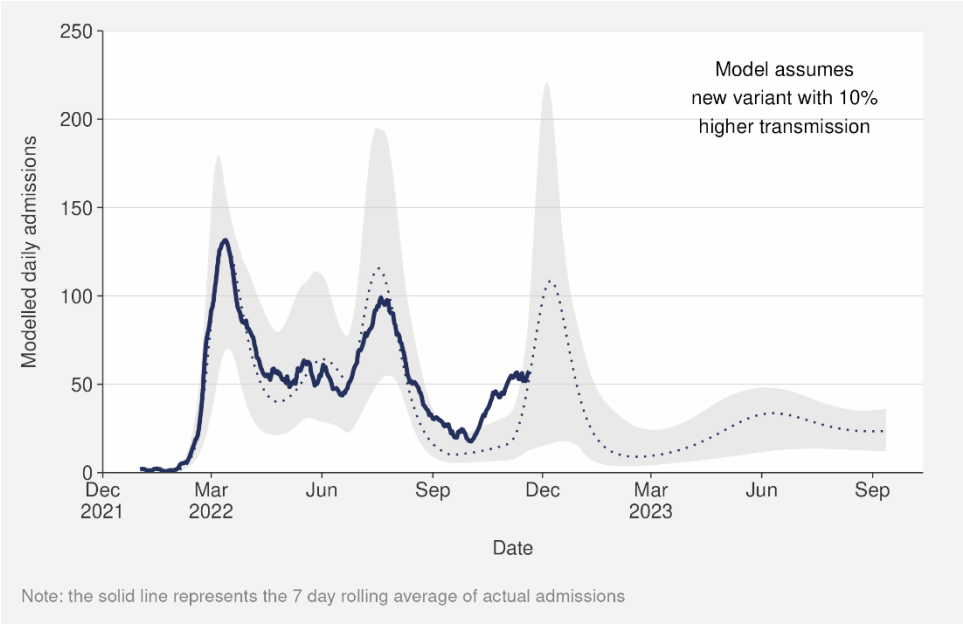


Source: NMDS/Inpatient's admissions feed as of 04 December 2022 data up to 27 November 2022

[7] New hospital admissions who had COVID-19 at the time of admission or while in hospital; excluding hospitalisations that were admitted and discharged within 24hrs. The 'for' measure excludes those who are identified as incidental with COVID-19, such as injuries. Recent trends are subject to revision. Please see glossary for further caveats.

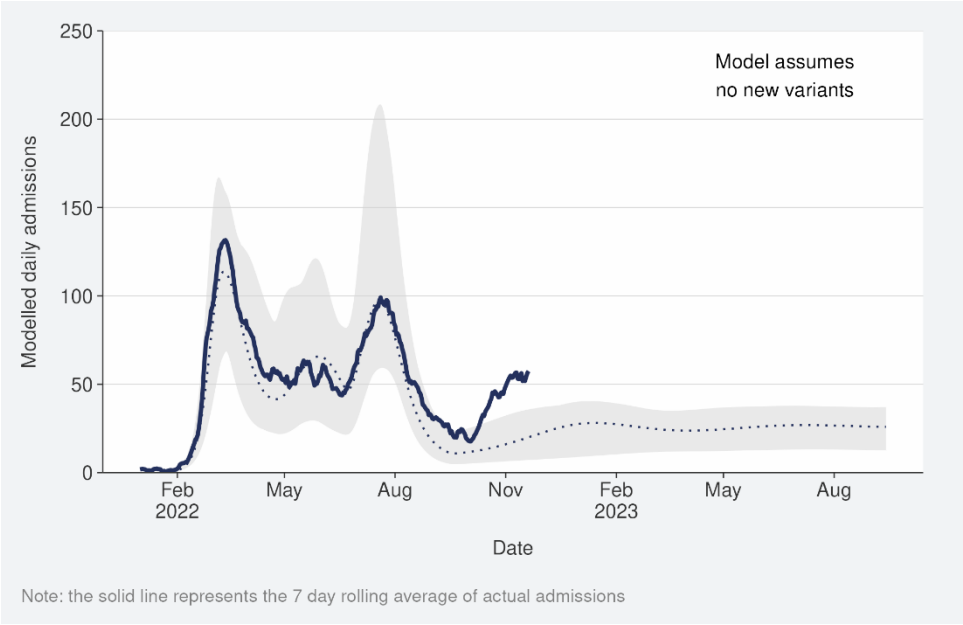
[8] Data are from Districts with tertiary hospitals; these Districts are Auckland, Canterbury, Southern, Counties Manukau, Waikato, Capital & Coast, Waitemata, and Northland.

Figure 7: COVID-19 Modelling Aotearoa hospital admissions scenario[9] compared with national admissions with 10% higher transmission



Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, October 2022, and Ministry of Health reported hospital admission data 20 November 2022

Figure 8: COVID-19 Modelling Aotearoa hospital admissions scenario compared with national admissions



Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, October 2022, and Ministry of Health reported hospital admission data 20 November 2022

[9] The 'October' scenario assumes previous infection provides greater protection against reinfection, severe disease, consistent with emerging international evidence, and transmissibility of an emerging variant is increased by 10%. It also incorporates updated data and future projections of uptake of second boosters, and an earlier transition to BA.5, consistent with the timing of cases and hospitalisations in New Zealand.

Mortality

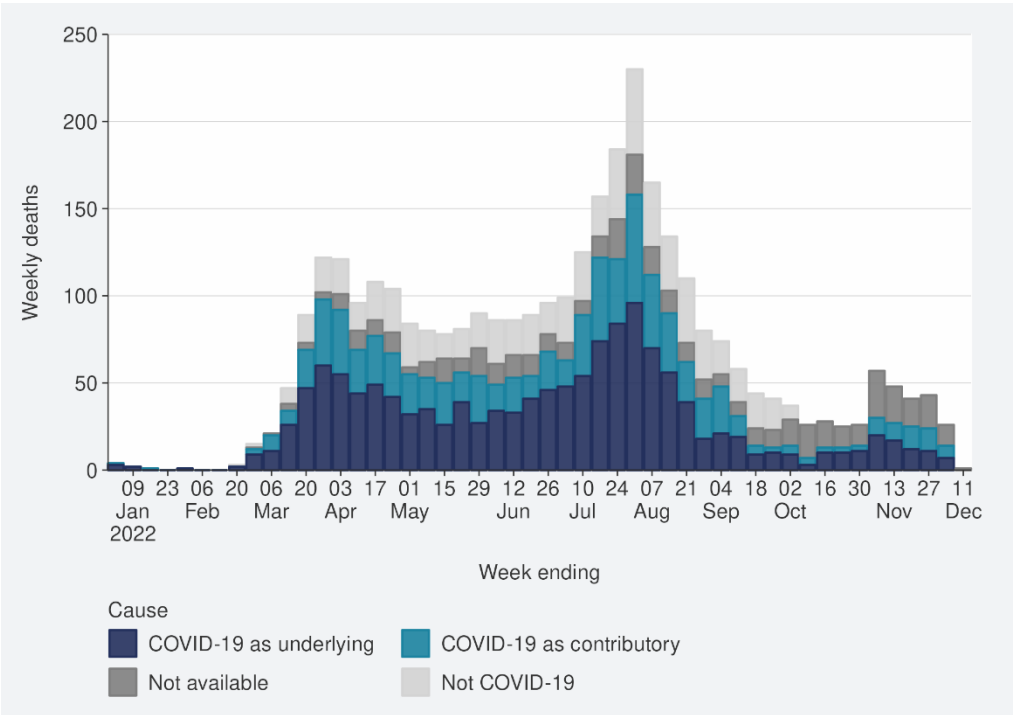
From the first week of January to 04 December 2022, there were 3,358 deaths among people who died within 28 days of being reported as a case and/or with the cause being attributable to COVID-19 (that is an underlying or contributory cause) (see **Figure 9**)[10].

Of these deaths that have been formally coded by cause of death, 1,369 (48%) were determined to have COVID-19 as the main underlying cause. COVID-19 contributed to a further 812 (28%) deaths and another 694 (24%) people died of an unrelated cause (**Figure 9**). As of 04 December, there were 2,181 deaths attributed to COVID-19 in 2022. Deaths peaked in the last week of July, and in the past few weeks the trend has been relatively stable.

Please note, all modelling scenarios will be updated next week. Deaths are currently tracking close to the median of the modelled scenario and may increase in the coming months if variant assumptions are borne out in the New Zealand context (see **Figure 10**).

Figure 11 shows the national death count and the modelled scenario which assumed no new variant.

Figure 9: National weekly death counts by cause of death[11], 01 January to 04 December 2022

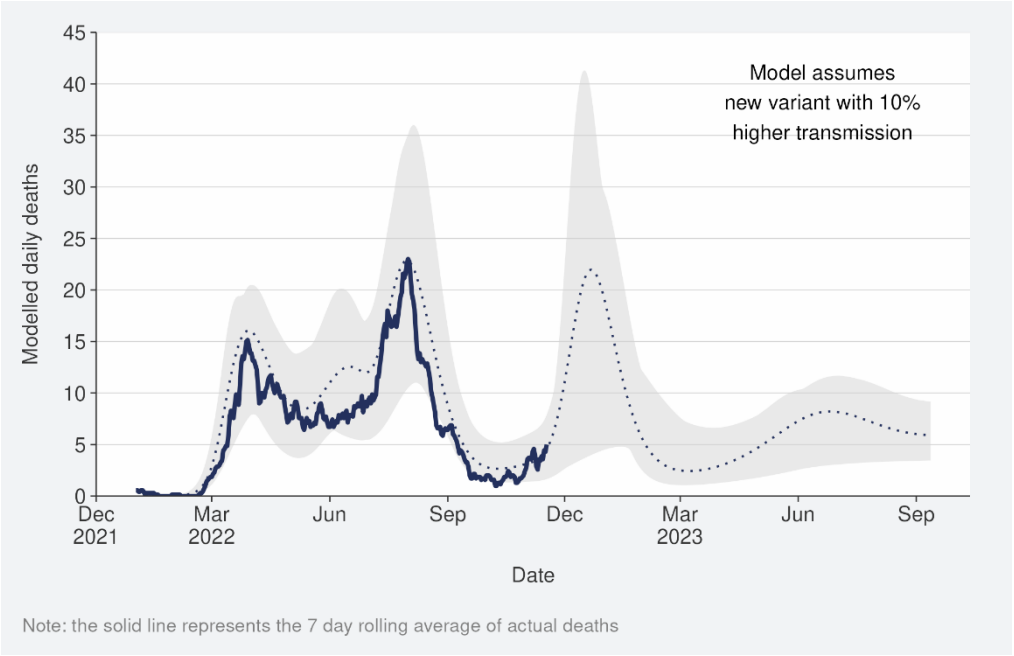


Source: Ministry of Health, 04 December 2022

[10] There were 56 deaths before the first week of 2022.

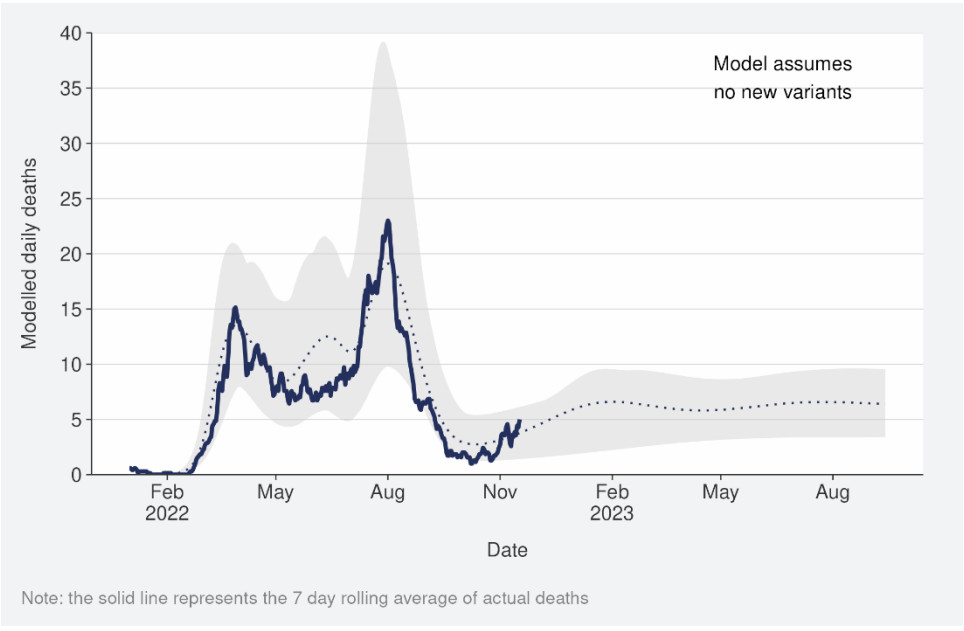
[11] Mortality data are affected by a delay due to time taken for reporting and death coding, the most recent weeks should be interpreted with caution.

Figure 10: COVID-19 Modelling Aotearoa death count compared with national observed deaths attributed to COVID-19



Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, October 2022, and Ministry of Health reported attributed deaths data 20 November 2022

Figure 11: COVID-19 Modelling Aotearoa death count compared with national observed deaths attributed to COVID-19



Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, October 2022, and Ministry of Health reported attributed deaths data 20 November 2022

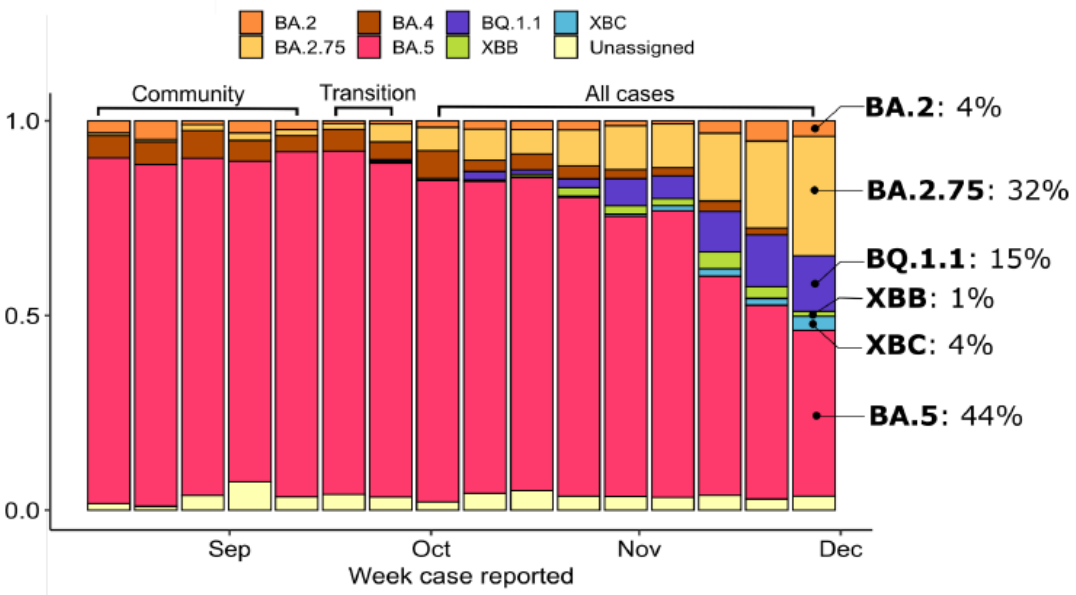
Whole Genomic Sequencing

Wastewater and Community cases

Whole genomic sequencing data are updated on a fortnightly basis; the data has not been updated in this week's report.

Wastewater variant analysis for the fortnight ending 25 November reports the following proportions: BA.4/5 40%, BA.2.75 39%, BQ.1.1 12%, XBC 7% and XBB 3%. **Figure 12** shows the proportions of variants in community cases, with BA.5 accounting for 44% of sequenced cases in the week to 25 November. Proportions of the BA.5 subvariant in the community have continued to decrease over the last few weeks, as the proportion of other variants increase: BA.2.75 (32%), BQ.1.1 (15%), and XBC (4%). 20 cases were identified with recombinant lineage XBC.; a recombinant lineage of Delta and Omicron variants that has been present in Australia and South-East Asia for some time, with no indication of increased disease severity. This lineage is not overrepresented among hospitalised cases in New Zealand at present.

Figure 12: Proportion of Variants of Concern in community cases[12]



Source: ESR COVID-19 Genomics Insights Report #28, EpiSurv/Microreact 0900hrs251 November 2022

[12] Before the end of the COVID-19 Protection Framework, only data from community cases are presented. In the period marked as "transition", cases known to be associated with the border were removed, but not all such cases can be reliably identified. Since the transition, data from all cases is used. Results before and after this transition are not directly comparable.

Hospitalised cases

Of samples collected from PCR positive hospital admissions for the fortnight ending 25 November 202/393 samples were successfully sequenced. As of 28 November; 59% were BA.5, 22% BA.2.75, 11% BQ.1.1, 3% BA.2, 2% XBC, 1%, XBB and <1% were BA.4.

Overall Variant Risk Status

In the second half of 2022, many new Omicron sub-variants have been reported. These variants demonstrate convergent evolution which is a process whereby variants from different lineages accumulate similar mutations. Mutations in the spike protein appear to be responsible for the enhanced characteristics of these variants, compared to previous Omicron variants.

Although many of these new sub-variants demonstrate a transmission advantage over earlier sub-variants (which can come from increases in innate transmissibility or from immune evasion), there is currently no evidence of an increase in severity of disease caused by these variants.

Subvariants detected in cases in New Zealand such as BQ.1.1, BA.2.75 sub-lineages (including CH.1.1), XBB and XBC. BQ.1.1 and XBB have demonstrated substantial immune evasion in laboratory testing compared to prior Omicron variants. Cases of these subvariants are continuing to increase relative to the proportion of cases of BA.5, contributing to an increase in overall cases in the coming weeks. However, it is unknown if one or more variants will cause a wave or produce overall higher baseline incidence.

There is no strong evidence of an increase in disease severity associated with these variants.

Refer to the appendix for further details on the risk assessments for BA.2.75, BQ.1.1 and XBB, respectively.

Further information on variants of concern is also available on the **Ministry of Health COVID-19 Science News Webpage**.

Reinfection

'Reinfection' is now defined as a case reported at least 29 days after the last time a person reported a positive test for COVID-19. The definition of reinfection changed on 30 June; prior to this, reinfection was based on reports at least 90 days apart (based on the international literature at the time). Up until 30 June 2022, the vast majority of positive results detected within 90 days of the prior infection were not recorded in the system. Some potential reinfections within 90 days were recorded but were not representative of the general population.

In general, reinfection refers to a second or subsequent infection after the prior infection has cleared. In this analysis, we are not able to distinguish between reinfection with the same variant or different variants. Reinfection with a different variant to the first infection is more likely than reinfection with the same variant.

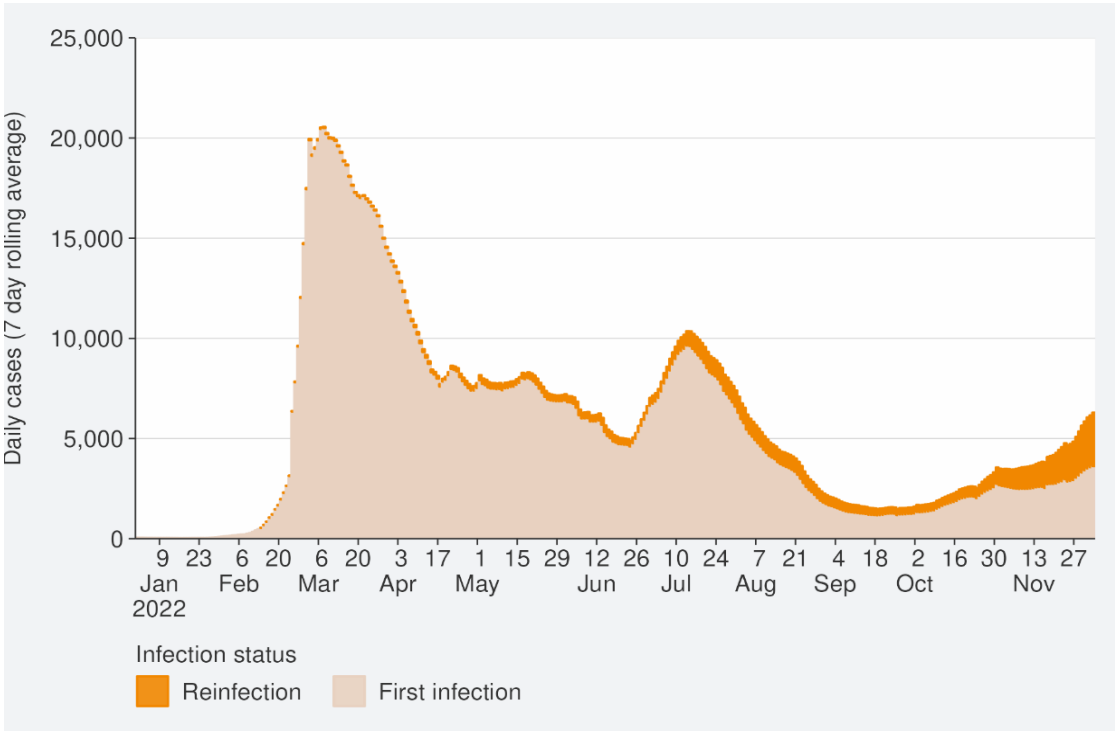
It is important to highlight, this data likely reports more on 'redetections' rather than true reinfections. True reinfections cannot be definitively captured in the data for a range of reasons. For example, a person with persistent infection due to being immunocompromised, who undergoes repeated testing due to regular hospital or clinical visits, would appear in the data as a 'reinfection' when they may have a chronic or persistent infection.

Figure 13 characterises the average number of cases per week by first infection and reinfection. Reinfections made up 26.2% of reported cases in the week ending 04 December. The proportion of reported cases that were reinfections has increased in the last four weeks, after being stable in the prior weeks. **Figure 14** shows how many first infections and reinfections have been reported cumulatively over time. Cumulatively, reinfections have made up 3.7% of total cases reported in 2022. The proportion of cases that are reinfections is expected to increase over time.

Figure 15 shows an age breakdown of reinfections by age group. Reinfections are highest in the 20-29 year olds and lowest in 80-89 year olds.

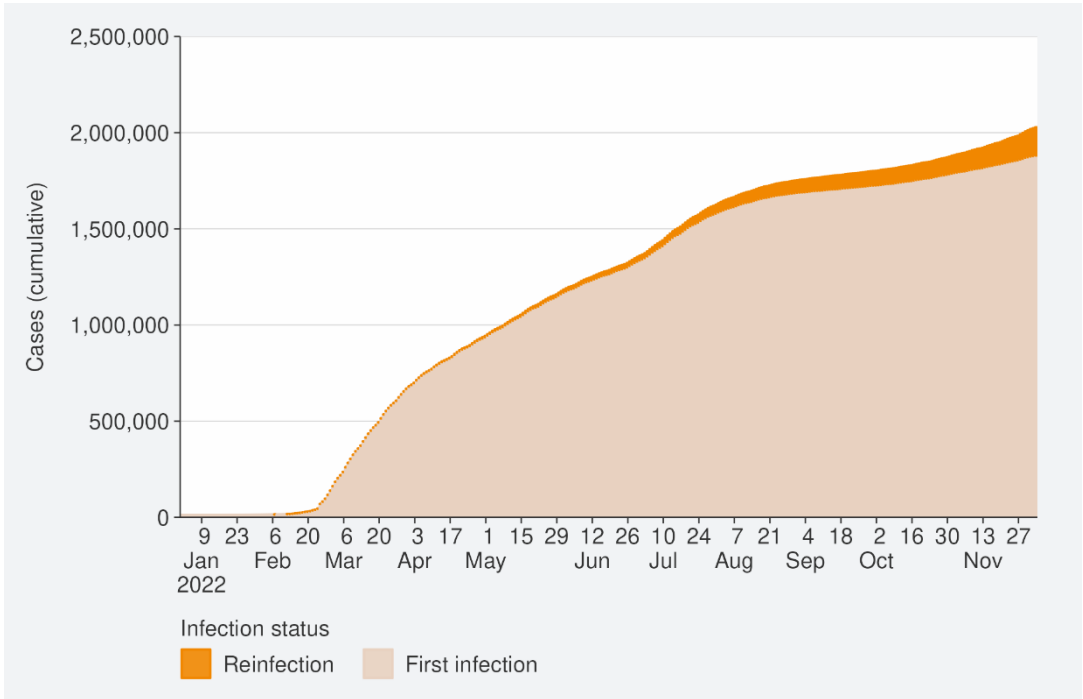
The true number of reinfections is likely higher than reported here. In general, reporting of cases is expected to decline over time. Due to under-ascertainment of the first infection and subsequent infections and, as both are required to detect a reinfection, there is likely to be under-reporting of reinfections.

Figure 13: Reinfections 7 day rolling average from 01 January to 04 December 2022



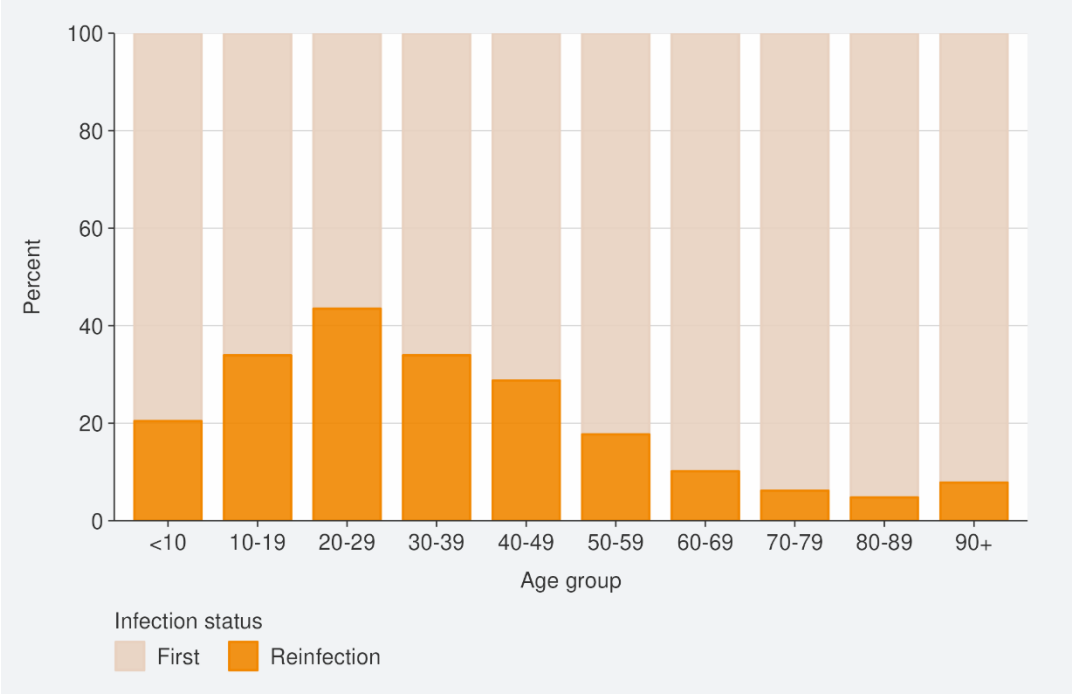
Source: NCTS/EpiSurv as at 2359hrs 04 December 2022

Figure 14: Reinfections cumulatively from 01 January to 04 December 2022



Source: NCTS/EpiSurv as at 2359hrs 04 December 2022

Figure 15: Reinfections by age group 01 January to 04 December 2022



Source: NCTS/EpiSurv as at 2359hrs 04 December 2022

Comparison of epidemic trends by ethnicity

For all ethnicities age-standardised reported case rates were similar and have increased for the week ending 04 December. Increases compared to the previous week ending 27 November were: 40.8% Pacific peoples, 25.0% Māori, 26.9% European or Other, and 22.4% Asian (see **Figure 16**). The highest reported case rates were in Pacific peoples (95.4 per 100,000); European or Other also had a similar rate (91.0 per 100,000); Asian and Māori had the lowest rate (82.6 and 77.4 per 100,000, respectively).

For all ethnicities, those in the 25-44 age group had the highest age-standardised reported case rates for the week ending 04 December. Rates in this age group were highest among Pacific peoples (134.4 per 100,000); followed by European or Other (110.5 per 100,000); Asian and Māori had similar case rates for those aged 25-44 (101.5 and 101.9 per 100,000 respectively). Refer to the appendix for non-age-standardised rates by ethnicity.

Figure 17 shows that the age-standardised hospitalisation rates for COVID-19 increased for Pacific peoples, Māori and Asian, and decreased for European or Other for the week ending 04 December as compared to the week prior. Māori had the highest age standardised hospitalisation rate (1.7 per 100,000) for the week ending 27 November; followed by Pacific peoples (1.6 per 100,000. For all ethnicities, those aged 80+ had the highest hospitalisation rates. Māori aged 80+ had the highest hospitalisation rate (18.6 per 100,000); followed by Asian (10.5 per 100,000); European and Other and Pacific Peoples had the lowest hospitalisation rate for those aged 80+ (7.8 and 6.8 per 100,000, respectively).

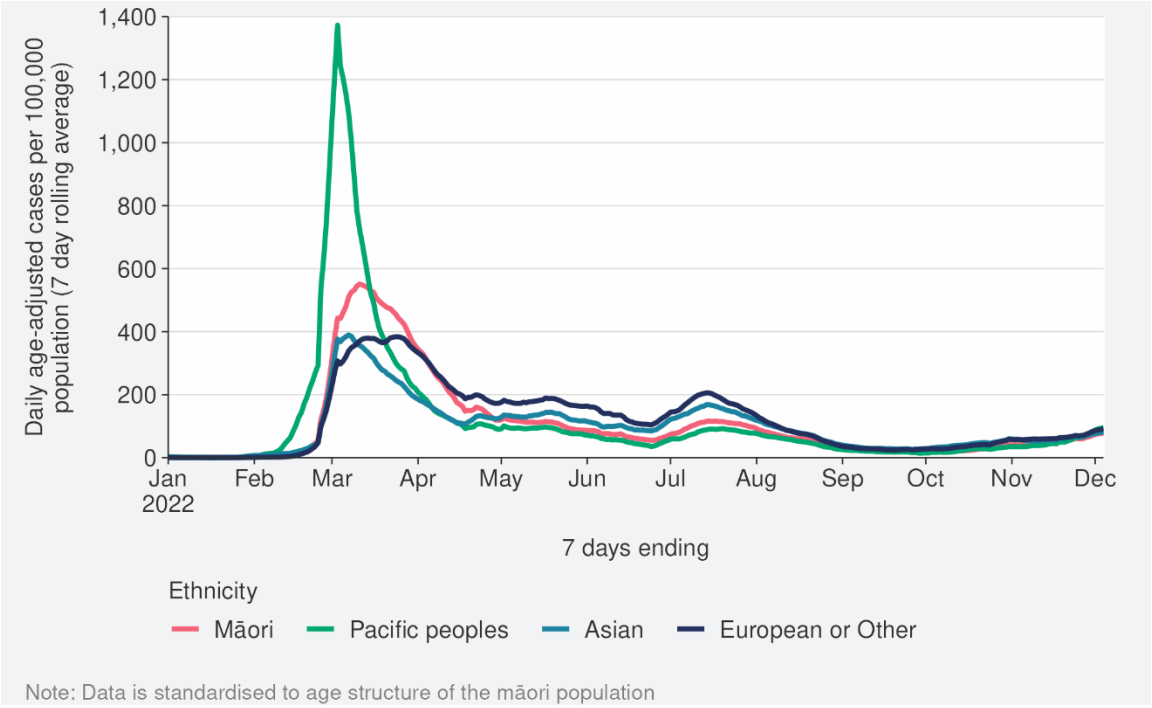
The cumulative total for the year shows that overall, Pacific peoples and Māori have had the highest risks of hospitalisation for COVID-19, 2.2 and 1.8 times the risk of European or Other, respectively for 01 January to 04 December. Asian people have had a hospitalisation rate almost 10% lower than European or Other (**Figure 18**).

The cumulative age-standardised mortality rate for 01 January to 27 November shows that Pacific peoples have had the highest risk, 2.3 times that of European or Other, followed by Māori at 1.9 times that of European or Other. Asian people have had the lowest risk of Mortality, 38% lower than European or Other (see **Figure 19**).[13]

The lower reported case rates, but higher hospitalisation and death rates for Māori and Pacific peoples, suggests they may have lower levels of case ascertainment and/or a higher risk of poor outcomes after infection compared with Asian and European or Other ethnicities.

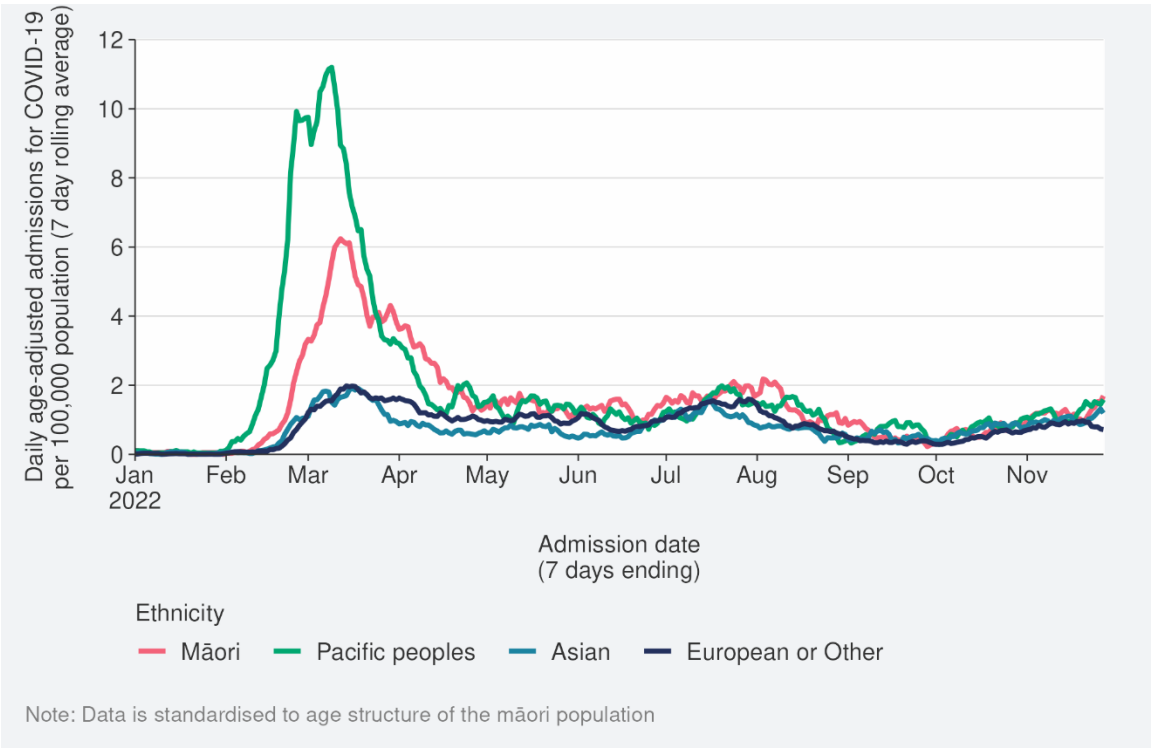
[13] These calculations are based on 2,158 deaths occurring between January 2022 and 27 November 2022 (excludes deaths in the last 2 weeks and deaths where ethnicity was unknown).

Figure 16: National age-standardised reported case rates by ethnicity from 01 January to 04 December 2022



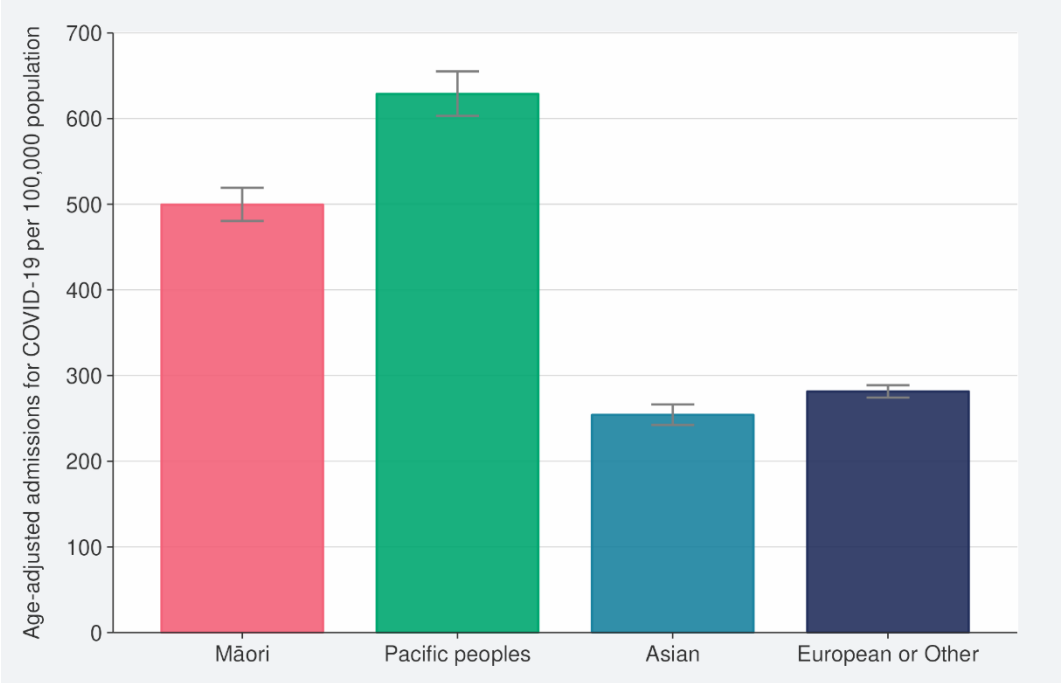
Source: NCTS/EpiSurv as at 2359hrs 04 December 2022

Figure 17: National age-standardised hospitalisation rates by ethnicity from 01 January to 27 November 2022



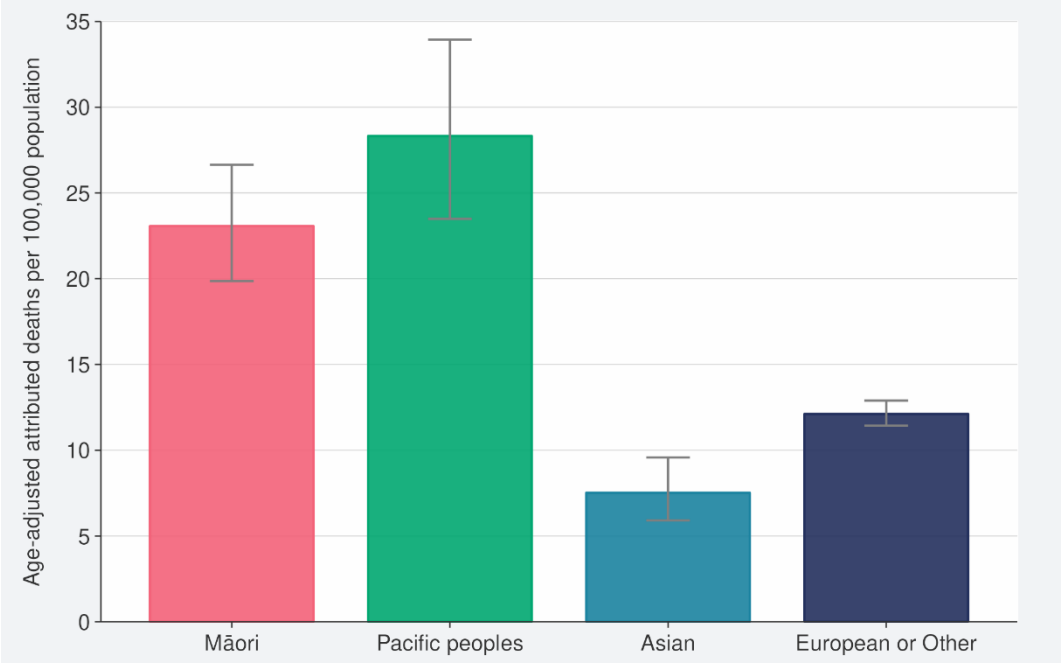
Source: NCTS/EpiSurv as at 2359hrs 27 November 2022

Figure 18: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation for COVID-19 by ethnicity, 01 January 2022 to 04 December 2022



Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, 01 January 2022 to 04 December 2022

Figure 19: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by ethnicity, 01 January 2022 to 04 December 2022



Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, 01 January 2022 to 04 December 2022

Comparison of epidemic trends by deprivation

Figure 20 shows the 7-day rolling average for reported case rates by residential area deprivation level (based on NZDep2018)[14]. Age-standardised case rates increased in all deprivation levels in the week ending 04 December. Refer to the appendix for non-age-standardised rates by deprivation.

Figure 21 and **Figure 22** show that those most deprived have had, and continue to have, the highest rates of hospitalisation, both recently and cumulatively during 2022. Those most deprived have had around two times the risk of hospitalisation compared with those who are least deprived.

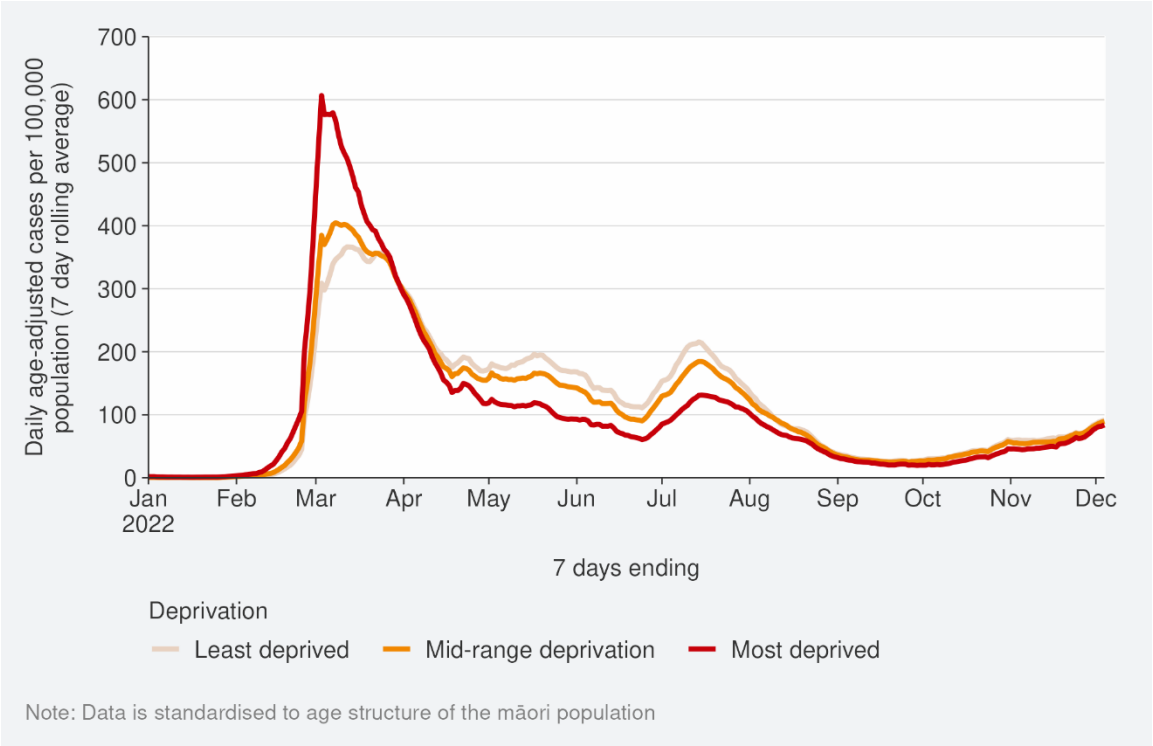
Cumulative rates of mortality are also highest for those most deprived; 2.3 times higher than the risk of those least deprived (**Figure 23**).[15]

As lower case rates have been reported among those most deprived, continued higher hospitalisation and death rates suggest those who are most deprived may have lower levels of case ascertainment and/or a higher risk of poor outcomes after infection compared with those who are least deprived.

[14] Atkinson J, Salmond C, Crampton P (2019). NZDep2018 Index of Deprivation, Final Research Report, December 2020. Wellington: University of Otago.

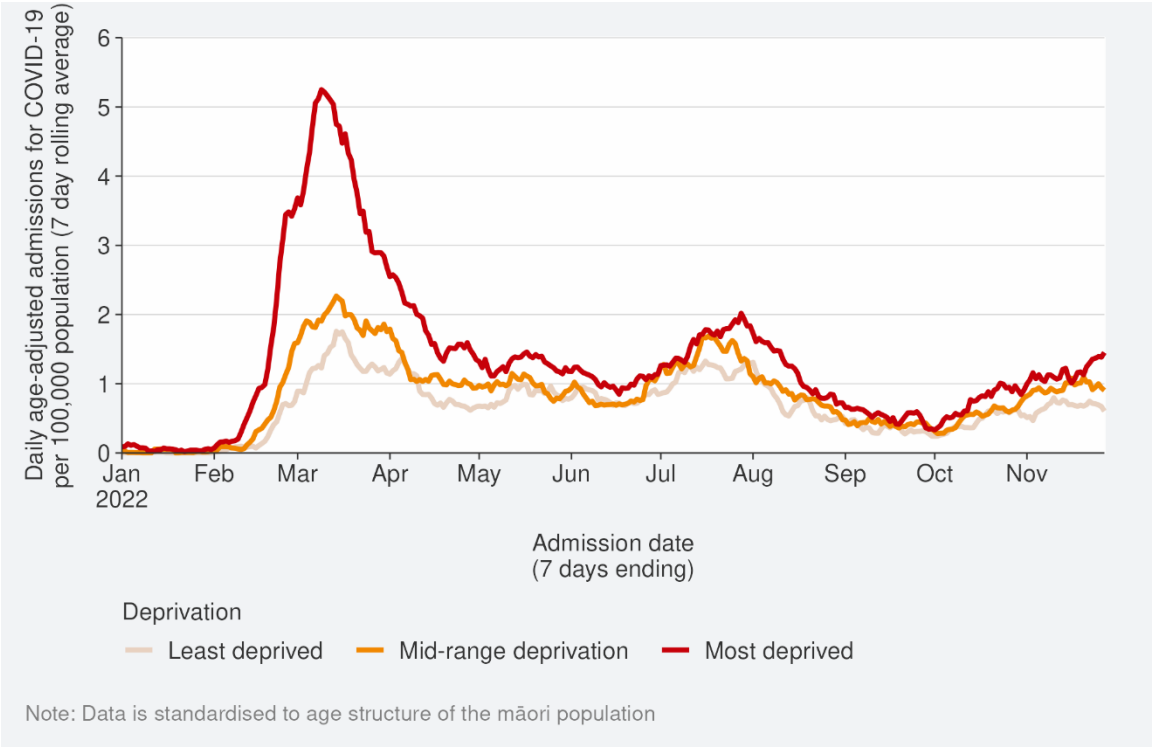
[15] These calculations are based on 2,128 deaths occurring between January 2022 and 20 November 2022 (excludes deaths in the last 2 weeks and deaths where the level of deprivation was unknown).

Figure 20: National age-standardised reported case rates by deprivation status for weeks 01 January to 04 December 2022



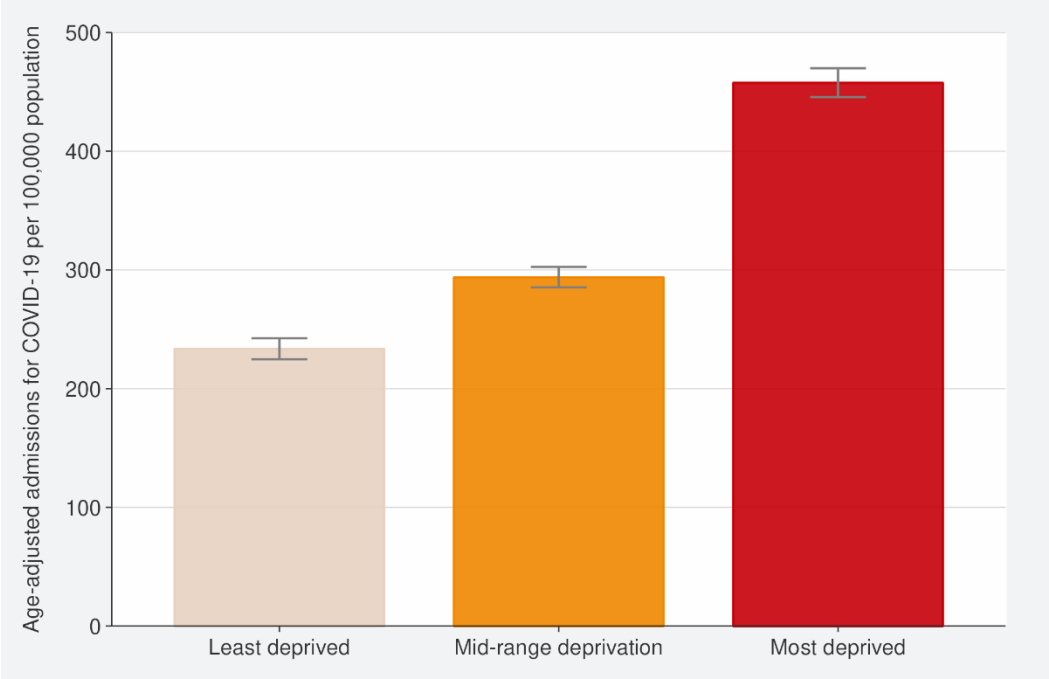
Source: NCTS/EpiSurv as at 2359hrs 04 December 2022

Figure 21: Age-standardised hospital admission rates for COVID-19 by deprivation from 01 January to 27 November 2022



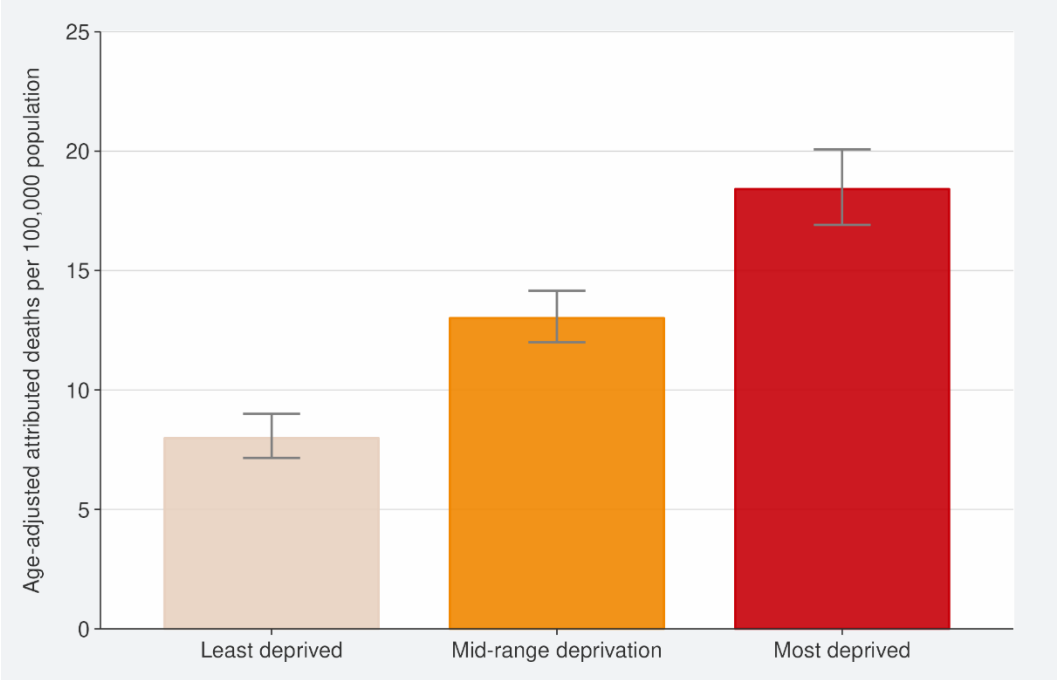
Source: NMDS/Inpatients admissions feed as of 27 November 2022 data up to 27 November 2022

Figure 22: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation for COVID-19 by deprivation, 01 January 2022 to 04 December 2022



Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates 01 January 2022 to 04 December 2022

Figure 23: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by deprivation, 01 January 2022 to 04 December 2022



Source: EpiSurv, Death Documents, The Healthcare User database, Mortality Collections database and CVIP population estimates, 01 January 2020 to 04 December 2022

Global pandemic summary

Over the next few months, we expect the global situation for the COVID-19 pandemic to be driven by the ongoing emergence of new variants, waning immunity, and particularly with the Northern Hemisphere heading into winter.

- Globally, in the week ending 04 December, the number of new weekly cases remained stable (-3%) as compared to the previous week, with under 3 million new cases reported. However, the true number of incident cases is likely to be underestimated due to a decline in testing internationally.
- The number of new weekly deaths decreased by 17% as compared to the previous week, with over 7,800 new fatalities reported.
- As of 04 December 2022, over 641 million confirmed cases and over 6.6 million deaths have been reported globally.
- From 05 November to 05 December 2022, the Omicron variant of concern accounted for 87.8% of sequences reported globally. Unassigned sequences (presumed to be Omicron) accounted for 12.2% of sequences submitted to GISAID in the week ending 20 November 2022.
- BA.5 and its descendent lineages continued to be dominant globally, accounting for 70.1% of sequences submitted to GISAID in the week ending 20 November 2022. During the same period, BA.4 descendent lineages declined from 2.8% to 2.0%; BA.2 and its descendent lineages increased from 9.6% to 10.5%.
- BQ.1 and its descendent lineages increased from 27.6% to 36.2% in the week ending 20 November, compared to the previous week. During the same period, the prevalence of XBB and its descendent lineages increased from 4.2% to 5.0%. BA.2.75 increased from 6.8% to 7.8%, while BA.4.6 decreased from 2.5% to 1.7%. BA.2.3.20 remained stable at 0.3%.
- In Australia, as of 02 December, cases and hospitalisations increased. In the 7 days to 02 December 2022, there were 671 new cases per 100,000 population. This was a 15% increase from the week prior (14 days to 25 November 2022) where there were 584 cases per 100,000 population.
- At the country level, the highest numbers of new weekly cases were reported from Japan (749,895 new cases; +7%), France (385,716 new cases; +38%), the Republic of Korea (370,574 new cases; -2%), the United States of America (296,333 new cases; -1%), and Brazil (188,043 new cases; +25%).

Sources: **Weekly epidemiological update on COVID-19 - 7 December 2022 (who.int)/ Coronavirus (COVID-19) common operating picture – 2 December 2022 (health.gov.au)**

Please note, global trends in cases, hospitalisations 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. Furthermore, approaches of counting hospitalisations and deaths can differ from country to country.

Appendix: Table of summary statistics

Table 1: Reported 7-day rolling average of case rates and hospital admissions by region, age group, ethnicity, and deprivation

	Reported Cases (7-day rolling average)					Hospital admissions (7-day rolling average)				
	Week ending 27/11/2022		Week ending 04/12/2022		% Change	Week ending 20/11/2022		Week ending 27/11/2022		% Change
	Number	Rate (per 100,000 population)	Number	Rate (per 100,000 population)		Number	Rate (per 100,000 population)	Number	Rate (per 100,000 population)	
National	**3862.6**	**73.8**	**4926.1**	**94.1**	**+27.5%**	**57.4**	**1.4**	**55.4**	**1.3**	**-2.3%**
Region										
Northern	1613.9	80.8	1955.3	97.9	21.2%	32.6	1.6	32.0	1.6	-1.8%
Te Manawa Taki	613.3	60.0	787.4	77.0	28.4%	7.1	1.6	6.7	1.5	-6%
Central	761.4	77.9	1011.3	103.4	32.8%	3.9	0.8	3.3	0.7	-14.8%
Te Waipounamu	868.4	71.9	1163.6	96.4	34%	13.1	1.1	13.4	1.1	2.2%
Age group										
<5	112.1	36.1	127.3	41.0	13.5%	4.7	1.9	4.7	1.9	0%
5-14	280.7	41.4	343.6	50.7	22.4%	1.4	0.3	0.7	0.1	-50%
15-24	498.3	76.2	641.6	98.1	28.8%	2.1	0.4	3.1	0.6	46.7%
25-44	1267	86.2	1608.3	109.4	26.9%	7.6	0.6	9	0.8	18.9%

45-64	1053.6	81.7	1379.7	107.0	31%	11.9	1.2	9.4	0.9	-20.5%
65+	652.0	78.5	825.7	99.4	26.6%	29.0	4.6	28.4	4.5	-2%
Ethnicity										
Māori	496.7	61.9	620.9	77.4	25%	4.9	0.9	8.7	1.7	79.4%
Pacific peoples	277.9	71.1	391.4	100.1	40.9%	4.9	1.4	5.7	1.6	17.6%
Asian	596.3	71.5	744.9	89.3	24.9%	6.9	0.9	9.3	1.2	35.4%
European or Other[16]	2470.7	78.0	3139.3	99.1	27.1%	40.1	1.6	31.7	1.3	-21%
Deprivation										
Least deprived	1183.0	78.1	1502.3	99.2	27%	13.7	1.1	11.7	0.9	-14.6%
Mid-range deprivation	1539.4	76.8	1935.4	96.5	25.7%	23.7	1.5	20.9	1.3	-12%
Most deprived	1074.0	68.5	1404.9	89.5	30.8%	17.6	1.5	21.4	1.8	22%

[16] 'Other' referring to all ethnicities other than Māori, Pacific peoples, Asian and European, specifically MELAA; Middle Eastern, Latin American and African. See Table 2 for breakdowns of MELAA ethnicities.

Table 2: Cumulative reported cases and hospitalisations admissions from 01 January 2022 to 27 November by level 2 ethnicity.

Ethnicity	Level 2 Ethnicity	Cumulative reported cases of COVID-19	Cases per 1,000 population	Cumulative hospitalisation for COVID-19	Hospitalisations per 1,000 population	Population
Asian	Asian NFD	9,506	426	32	1	22,320
Asian	Chinese	66,553	283	564	2	235,331
Asian	Indian	102,733	419	865	4	245,079
Asian	Other Asian	50,059	411	355	3	121,732
Asian	Southeast Asian	57,552	528	287	3	108,939
Māori	Māori	287,075	376	3463	5	762,780
MELAA	African	10,445	396	124	5	26,364
MELAA	Latin American / Hispanic	14,413	497	81	3	28,998
MELAA	Middle Eastern	10,326	319	177	5	32,395
Pacific Peoples	Cook Island Māori	20,195	379	307	6	53,299
Pacific Peoples	Fijian	18,522	452	207	5	40,956
Pacific Peoples	Niuean	8,281	425	131	7	19,477
Pacific Peoples	Other Pacific Island	7,240	500	77	5	14,466
Pacific Peoples	Pacific Island NFD	1,717	469	6	2	3,663
Pacific Peoples	Samoan	71,195	459	1127	7	154,997
Pacific Peoples	Tokelauan	2,990	436	47	7	6,863
Pacific Peoples	Tongan	30,982	426	544	7	72,703

Public Health Risk assessment for BA.2.75 (Centaurus), BQ.1.1 (Cerberus) and XBB (Gryphon)

The 'Overall risk assessment' is presented in comparison to the prior or current predominant variant, in this case BA.5. 'Increased risk' indicates the assessed variant as worse than the previous predominant variant with regards to that characteristic; 'no change' means that the assessed variant poses equivalent risk; and 'decreased risk' means that the assessed variant is better than the previous predominant variant.

'Confidence level' indicates the overall quality of data that are available to make the risk assessment: 'High' (high quality, robust data); 'Moderate' (good data with limitations); 'Low' (very little data available). 'Insufficient data' indicates that there are no data of reasonable quality on which to base an assessment at this time.

Table 3: Public Health Risk assessment for BA.2.75 (Centaurus), 01 December 2022

BA.2.75 has 8 key mutations from BA.2: 147E, 152R, 157L, 210V, 257S, 339H, 446S, 460K.

	Overall risk assessment*	**Confidence level ****	**Assessment and rationale**
Overall growth advantage	**Increased Risk**	**Moderate**	**Evidence of a growth advantage compared to BA.5. Prevalence in New Zealand is increasing gradually.** There is evidence that BA.2.75 has a growth advantage against BA.4/5 in some countries (India, Austria, Singapore). BA.2.75 and sub-lineages (excluding BN.1) have an estimated growth advantage of 22.5% per week (95% Credible Interval: 19.1 to 26.0%) compared to BA.5.2 in the UK (at 9 November 2022). BA.2.75 (and its descendant sub-lineages) are making up an increasing proportion of sequenced cases in New Zealand. In the fortnight ending 25 November 2022 it made up 32% of sequenced cases and 22% of isolates from hospital cases.
Transmissibility	**Insufficient data**	**Insufficient data**	There are no direct data on intrinsic transmissibility and there is no current ability to measure this directly from surveillance data.

Immune evasion	**No change in risk**	**Low**	**No evidence of increased immune evasion.** Mutations suggest that BA.2.75 may have immune evasion potential. However, there is very limited data to evaluate immune evasion against vaccination, prior infection with BA.5, or a combination of the two (hybrid immunity). There are no estimates of vaccine effectiveness against BA.2.75. Laboratory data: Neutralisation studies found that BA.2.75 was similar or slightly less able to neutralise antibodies produced after vaccination and BA.2 infection, compared to BA.4 or BA.5. Potentially higher receptor binding compared to other Omicron lineages. There are no data on the ability of antibodies produced after BA.5 infection to neutralise BA.2.75.
Severity	**Insufficient data**	**Insufficient data**	**No evidence of a change in severity compared to BA.5** Few formal evaluations of BA.2.75 severity are available. An early assessment of the severity of BA.2 sub-lineages in India indicates that BA.2.74, BA.2.75, and BA.2.76 are causing 'mild' disease with no evidence of an increased risk of hospital admission or severe disease. Lab and animal studies suggest mixed results for binding compared to BA.5, (59) but overall pathogenicity similar to BA.5. Some *in vitro* evidence to suggest an increases in cell-cell fusion and ability to infect lower airways compared to BA.2 which could alter pathogenicity.
Therapeutics	**Insufficient data**	**Insufficient data**	
Testing	**Insufficient data**	**Insufficient data**	
Overall Assessment	**There is an increase in overall risk from the previous predominant variant, BA.5. (Moderate confidence)** **BA.2.75 and associated sublineages are increasing in frequency in New Zealand and appear to be more transmissible and immune evasive.**		

Source: SARS-CoV-2 Variants of Concern Update – Manatū Hauora, Ministry of Health

Table 4: Public Health Risk assessment for BQ.1.1 (Cerberus), 01 December 2022

BQ.1.1 is related to BA.5.3 but with Spike protein mutations 444T, 460K, 346T

	Overall risk assessment*	Confidence level **	Assessment and rationale
Overall growth advantage	**Increased risk**	**Moderate**	**Evidence of a growth advantage compared to BA.5.** BQ.1.1 variant has an estimated growth advantage of 48.5% per week (95% Credible Interval: 43.3 to 54.1%) compared to BA.5.2 in the UK (at 9 November 2022). Currently present in New Zealand and is growing relative to BA.5. In the fortnight ending 25 November 2022, it made up 15% of sequenced cases and 11% of isolates from hospital cases.
Transmissibility	**Insufficient data**	**Insufficient data**	No direct data on intrinsic transmissibility and there is no current ability to measure from surveillance data. There is some laboratory evidence that ACE2 binding is increased for BQ.1.1 compared to prior Omicron variants which may affect transmissibility/infectivity.
Immune evasion	**Increased risk**	**Moderate**	**Evidence of increased immune evasion.** More resistant to neutralisation from sera of vaccinated and infected individuals. At least 2 small studies show that mRNA bivalent BA.4/5 vaccine produces robust neutralising activity against BQ.1.1 compared to monovalent wild type vaccine.
Severity	**Insufficient data**	**Insufficient data**	**No evidence of a change in severity compared to BA.5** Evidence from a surge of cases of this variant in France suggests it is not causing increased rates of hospitalisations and deaths.
Therapeutics	**Increased risk**	**Low**	*In vitro* studies showed loss of efficacy of all currently approved clinical monoclonal antibody therapies including Evusheld and Bebtelovimab.
Testing	**Insufficient data**	**Insufficient data**	Evidence that suggests a clinically relevant decrease in the performance of RATs for detection of the Omicron variant (varies by device), but it is uncertain how this will affect sensitivity specifically for BQ.1.1

Overall Assessment	**There is an increase in overall risk from the previous predominant variant, BA.5. (Moderate confidence)** **BQ.1.1 is increasing in frequency overseas and appears to be more transmissible and immune evasive.**

Source: SARS-CoV-2 Variants of Concern Update – Manatū Hauora, Ministry of Health

Table 5: Public Health Risk assessment for XBB (Gryphon), 01 December 2022

XBB is a recombinant virus (related to BA.2 and BJ.1) with additional spike protein mutations 364T, 445P, 446S and 490V

	Overall risk assessment*	**Confidence level ** **	**Assessment and rationale**
Overall growth advantage	**Increased risk**	**Low**	**Evidence of a growth advantage compared to BA.5** XBB has an estimated growth advantage of 56.9% per week (95% Credible Interval: 46.9 to 67.2%) compared to BA.5.2 in the UK (at 9 November 2022). Currently present in New Zealand and is fluctuating between 1-4% of sequenced cases. In the fortnight ending 25 November 2022, it made up 1% of all sequenced cases and 1% of isolates from hospital cases.
Transmissibility	**Insufficient data**	**Insufficient data**	No direct data on intrinsic transmissibility and there is no current ability to measure from surveillance data. There is some laboratory evidence that ACE2 binding is increased for XBB compared to prior Omicron variants which may affect transmissibility/infectivity.
Immune evasion	**Increased risk**	**Moderate**	***Evidence of increased immune evasion.*** More resistant to neutralisation from sera of vaccinated and breakthrough infected individuals.
Severity	**Insufficient data**	**Insufficient data**	In late October 2022 the World Health Organization Technical Advisory Group on SARS-CoV-2 Virus Evolution noted that current (limited) information does not indicate an increase in severity for XBB.
Therapeutics	**Increased risk**	**Low**	*In vitro* studies showed loss of efficacy of all currently approved clinical monoclonal antibody therapies including Evusheld and Bebtelovimab.

Testing	**Insufficient data**	**Insufficient data**	Evidence that suggests a clinically relevant decrease in the performance of RATs for detection of the Omicron variant (varies by device), but it is uncertain how this will affect sensitivity specifically for XBB.
Overall Assessment	**No change in risk**		

Source: SARS-CoV-2 Variants of Concern Update – Manatū Hauora, Ministry of Health