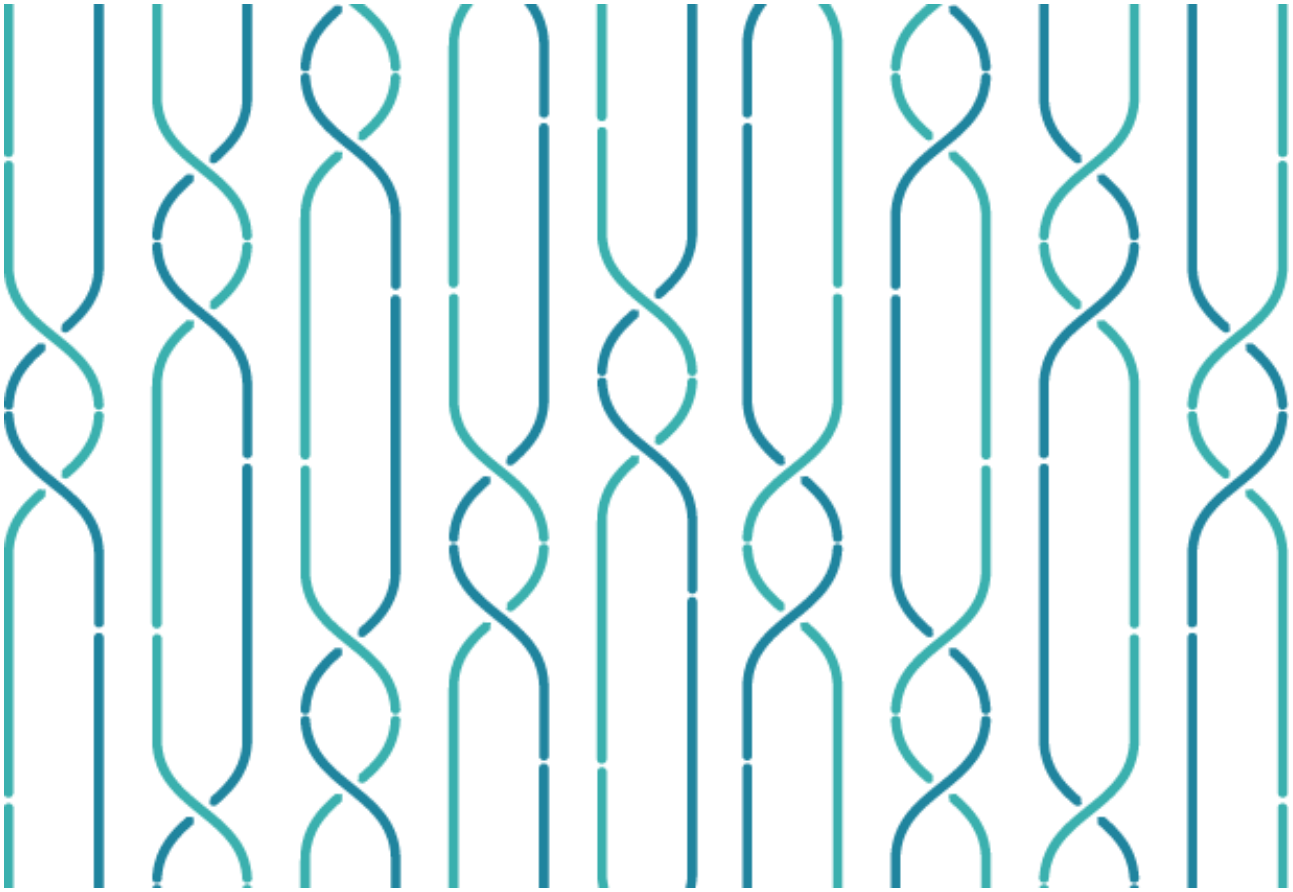
Te Kāwanatanga o Aotearoa
New Zealand Government

MANATŪ HAUORA
MINISTRY OF HEALTH

COVID-19 TRENDS AND INSIGHTS REPORT

16 December 2022



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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 used to monitor the COVID-19 epidemic showed an increase in the past week. Case rates, wastewater quantification of viral genomes and hospital admission have increased; mortality has been relatively stable.

The proportion of BA.2.75 variant was an estimated 39% of cases which surpassed BA.5 variant (33% of cases). Detections of BQ.1.1 and BA.2.75 are trending upward; XBC and XBB were steady both in whole genomic sequencing (WGS) and wastewater.

It is likely that cases, hospitalisations and mortality will continue to 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 109.3 per 100,000 population for the week ending 11 December. This was an increase from the previous week, which was 94.2 per 100,000. This week rates were highest in the 25-44 age group, followed by 65+ (126.5 and 123.3.0 per 100,000, respectively). The proportion of cases that were reinfections has increased this week, making up 27.7% of cases.
Wastewater	Wastewater quantification of viral RNA has indicated a large increase in infections in the past week.
Hospitalisations	The COVID-19 hospital admissions rate decreased substantially from mid-July but has increased since early October. In the week ending 04 December, the 7-day rolling average of hospital admissions was 1.8 per 100,000 population, an increase compared to the previous week (1.3 per 100,000). The rate was highest in the 65+ age group (5.7 per 100,000).
Mortality	As of 11 December, there were 2,203 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.
Variants of Concern	Prevalence of non-BA.5 variants continues to increase. BA.5 accounts for only 33% of sequenced cases seen in the week ending 09 December, BA.2.75 is now the dominant variant (39%), BQ.1.1 (14%), and XBC (5%). Wastewater variant analysis for the fortnight ending 11 December reports the following proportions: BA.2.75[1] 58%, BA.4/5 19%, BQ.1.1 18%, XBC 3% and XBB 2%.

Māori

Cases	The 7-day rolling average of age-standardised reported case rates has been increasing for the past four weeks to 95.4 per 100,000 population on 11 December, lower than for European or Other, however there may be case ascertainment biases. Rates were highest in those aged 25-44 (121.4 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 04 December was 1.7 per 100,000 population and was highest for those aged 80+ (12.8 per 100,000).
Mortality	The age-standardised cumulative mortality rate for Māori was 1.7 times higher than European or Other in 2022.

[1] Here BA.2.75 refers to BA.2.75/CH.1.1/BR.2 constellation of subvariants

Pacific peoples

Cases	The 7-day rolling average of age-standardised reported case rates has been increasing for the past five weeks to 115.8 per 100,000 population as at 11 December. Rates were highest in those aged 25-44 (163.1 per 100,000).
Hospitalisations	Pacific peoples have the highest age-standardised cumulative risk of hospital admission in 2022, 2.3 times higher than European or Other. The 7-day rolling average to 04 December was 2.5 per 100,000 and was highest in those aged 80+ (21.2 per 100,000).
Mortality	Pacific peoples have the highest age-standardised cumulative mortality risk of any ethnicity in 2022, 2.1 times that of European or Other.

International Insights

Globally, in the week ending 11 December, the number of new weekly cases remained stable (+2%) as compared to the previous week, with over 3.3 million new cases reported. The number of new weekly deaths increased by over 10% as compared to the previous week, with over 9,700 new fatalities reported.
BA.5 and its descendent lineages continued to be dominant globally, accounting for 73.7% of sequences submitted to GISAID in the week ending 20 November 2022. During the same period, BA.4 descendent lineages declined to 2.0%; XBB and descendent lineages account for 3.9%, indicating a rising trend.
At the country level, the highest numbers of new weekly cases were reported from Japan (849,371 new cases; +13%), the United States of America (448,634 new cases; +50%), the Republic of Korea (420,392 new cases; +13%), France (366,699 new cases; -5%), and Brazil (194,170 new cases; +3%).
In Australia, in the 14 days to 09 December 2022, there were 764 new cases per 100,000 population. This is a 14% increase from the week prior (14 days to 02 December 2022) where there were 671 per 100,000 population.
As of 14 December, China stopped tracking asymptomatic COVID-19 cases. COVID-19 testing has become voluntary for most people. Confirmed symptomatic cases will continue to be tracked and recorded. As of 13 December, Hong Kong lifted all COVID-19 restrictions on inbound travellers such as travellers only need to take the RAT rather than PCR upon arrival. China's travel code, which was used to track whether people had travelled to areas with COVID-19 cases, went offline as of 13 December.

National summary of epidemic trends

Case trends

Evidence suggests the incidence in the community has increased in the past week. Both reported[2] case rates and levels of viral ribonucleic acid (RNA) in wastewater have increased in the week to 11 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 51% (90% Uncertainty Interval: 0.36 to 0.53) for the fortnight to 11 December[3].

Modelling has been updated to better fit recent data and capture the impact of changes to public health measures on the 12th of September 2022 and the impact of new variants, indicating cases are expected to increase (see **Figure 2**)[4]. Reported cases have been tracking around the modelled best fit since early September. However, in the week ending 11 December, cases tracked below the modelled best fit.

The reported case rate for the week ending 11 December was 109.3 per 100,000, a 16.1% increase compared to the previous week (94.2 per 100,000). Case rates increased in all regions; the rate was highest in Central region (117.5 per 100,000) and lowest in Te Manawa Taki (89.8 per 100,000) (See **Figure 3**).

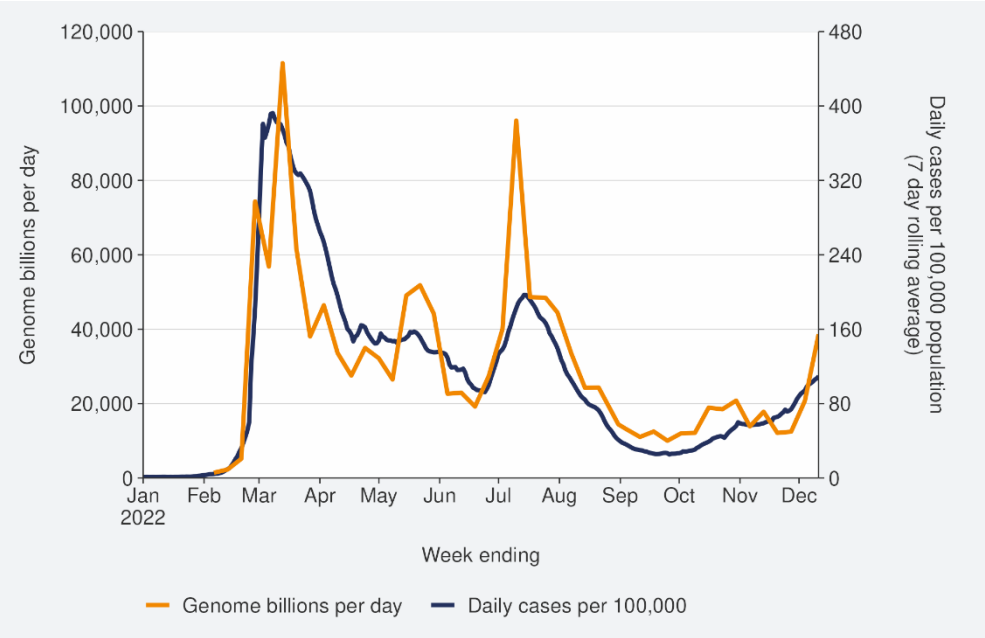
Case rates across all age groups (under 5, 15-24, 25-44, 45-64, 65+) have increased compared to the week prior. The highest rates across all age groups were in those aged 25–44, 45-64 and 65+ (126.5, 122.7, and 123.3 per 100,000, respectively). The lowest rates were among under 5 years and 5–14-year-olds (46.1 and 55.0 per 100,000, respectively) (see **Figure 4**).

Table 1 of the appendix provides information on specific rates.

[2] 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.

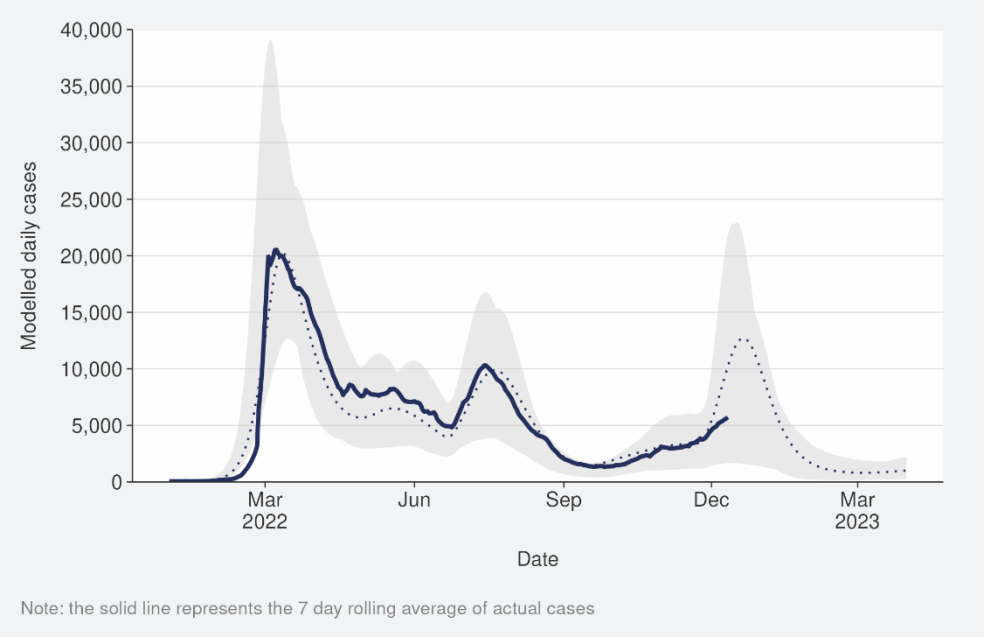
[3] Case ascertainment has declined from peak ascertainment in March. Work is underway to provide estimates of the peak ascertainment and current ascertainment levels. The wastewater data has not yet been seasonal adjusted and therefore maybe subject to change depending on rainfall patterns across the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

Figure 1: National wastewater trends (SARS-CoV-2 genome copies)[4] and reported cases to 11 December 2022



Sources: ESR SARS-CoV-2 in wastewater update for week ending 11 December 2022 and NCTS/EpiSurv as at 2359hrs 11 December 2022

Figure 2: COVID-19 Modelling Aotearoa scenarios[5] compared with national reported case numbers

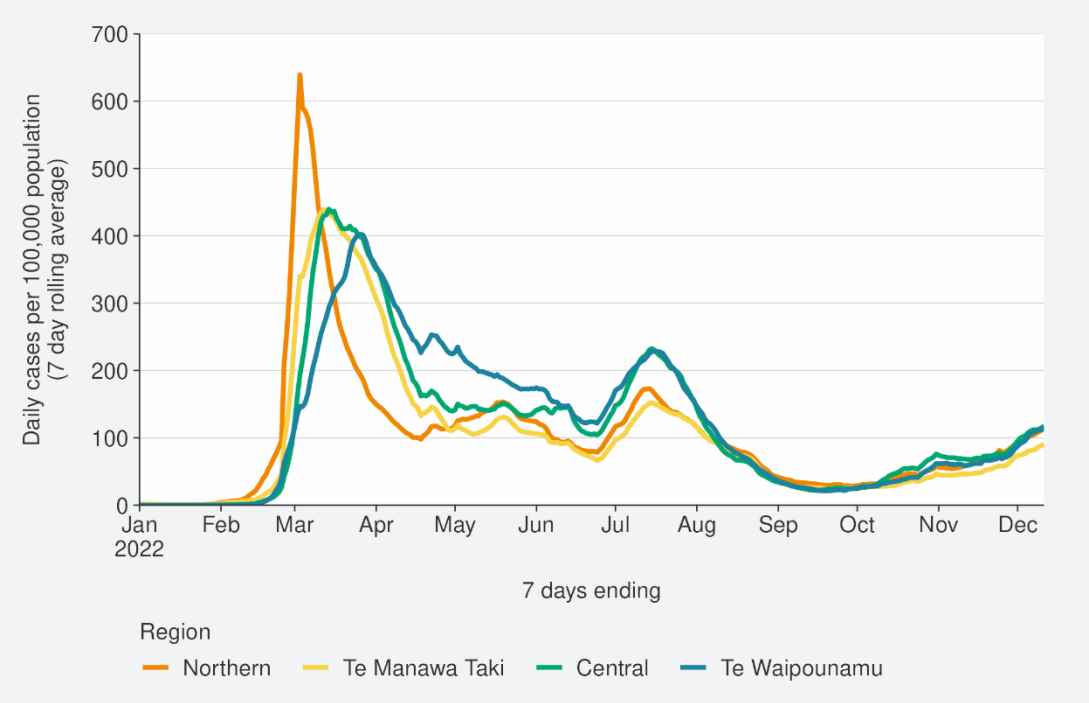


Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, October 2022, and NCTS/EpiSurv as at 2359hrs 11 December 2022

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

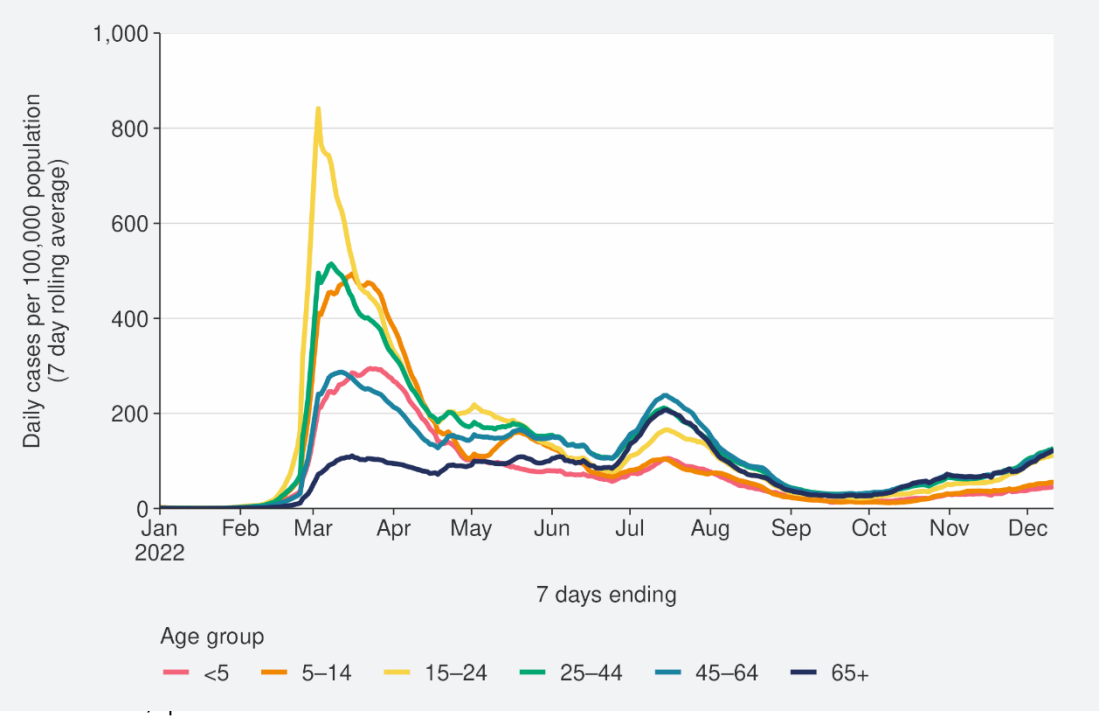
[5] The 'July' BA.5 scenario assumes that previous infection provides greater protection against reinfection and severe disease, this is consistent with emerging international evidence. It also incorporates updated data and future projections of uptake of second boosters, and an earlier transition to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

Figure 3: Regional reported case rates from 01 January to 11 December 2022



Source: NCTS/EpiSurv as at 2359hrs 11 December 2022

Figure 4: National reported case rates by age from 01 January to 11 December 2022



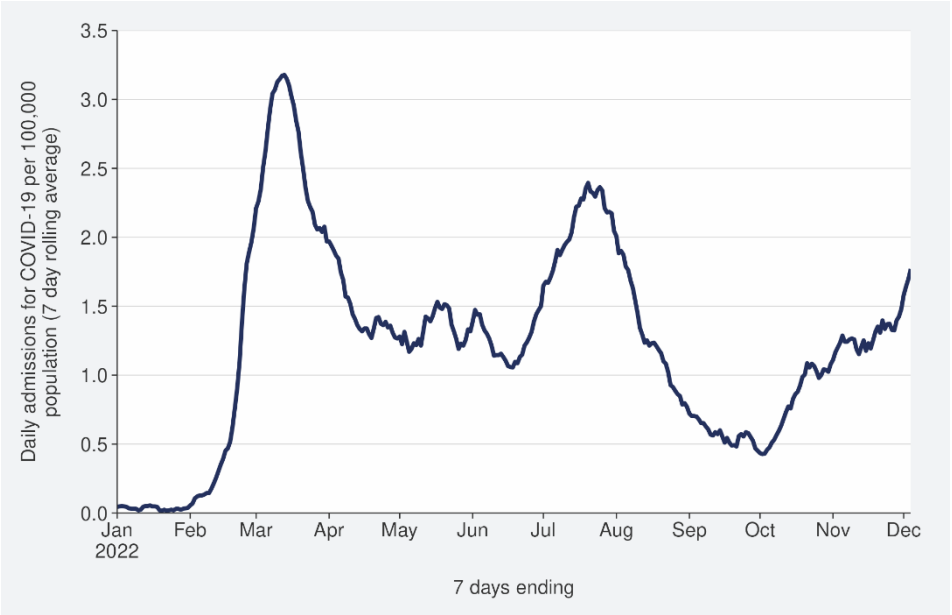
Hospitalisation and mortality trends

Hospitalisation

As seen in **Figure 5**, the national COVID-19 hospital admissions rate 'for' COVID-19 decreased substantially from mid-July but has increased since early October. In the week ending 04 December [6], the 7-day rolling average of hospital admissions was 1.8 per 100,000 population, an increase compared to the previous week (1.3 per 100,000). The rate was highest in the 65+ age group (5.7 per 100,000).

Modelling scenarios suggest current hospital admissions are tracking the best fit of the model prediction and indicate admissions are expected to increase (see **Figure 6**).

Figure 5: National[7] hospital admissions rate for COVID-19, 01 January to 04 December 2022

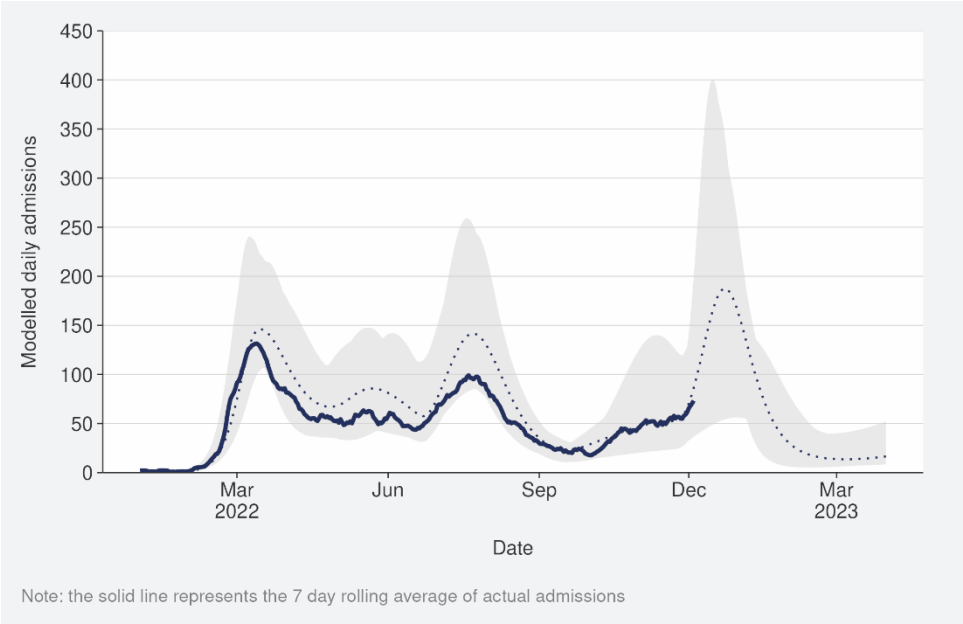


Source: NMDS/Inpatient's admissions feed as of 12 December 2022 data up to 04 December 2022

[6]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.

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

Figure 6: COVID-19 Modelling Aotearoa hospital admissions for COVID-19 scenario[8] compared with national admissions



Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, October 2022, and Ministry of Health reported hospital admission data 04 December 2022

Mortality

From the first week of January to 11 December 2022, there were 3,394 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 7**)[9].

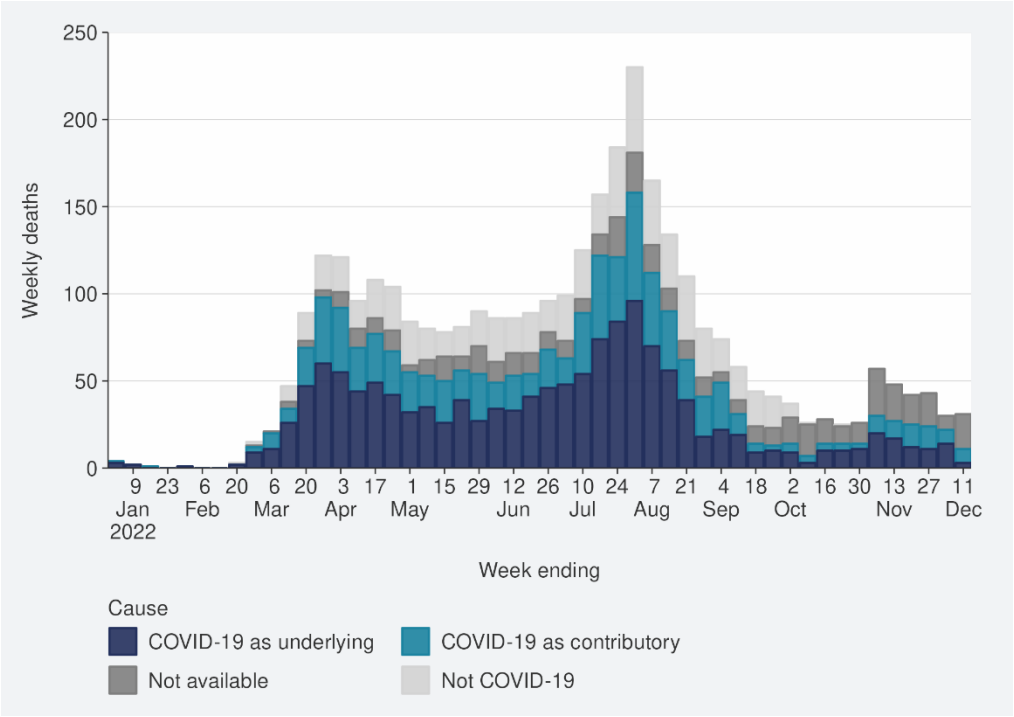
Of these deaths that have been formally coded by cause of death, 1,380 (48%) were determined to have COVID-19 as the main underlying cause. COVID-19 contributed to a further 823 (28%) deaths and another 696 (24%) people died of an unrelated cause (**Figure 7**). As of 11 December, there were 2,203 deaths 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.

Deaths are currently tracking well below the best fit of the modelled scenario and are predicted to increase in the coming months (see **Figure 8**).

[8] 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.

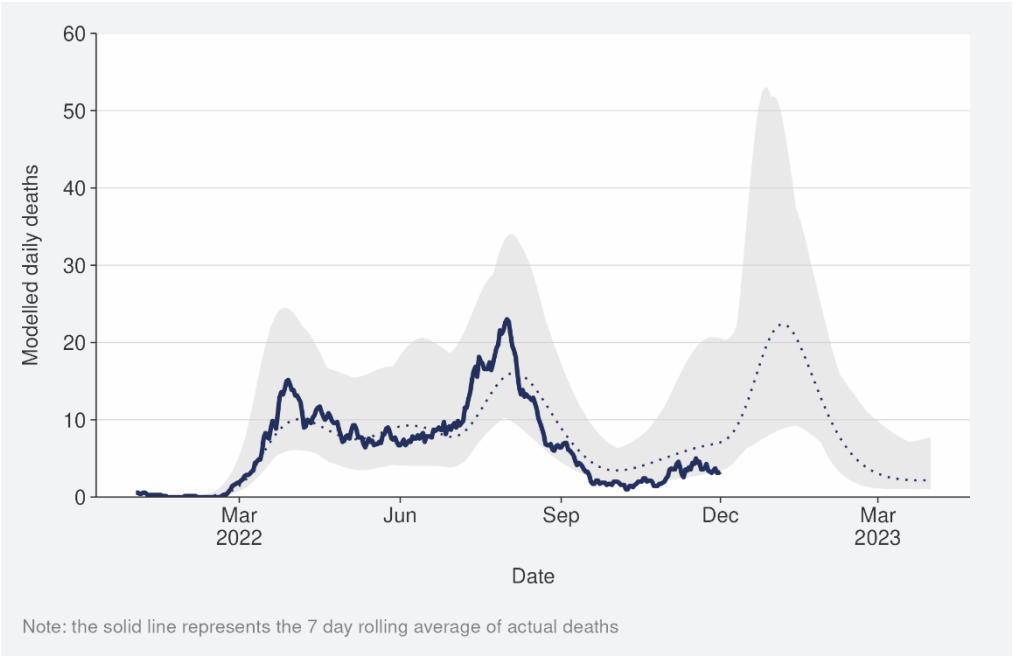
[9] There were 56 deaths before the first week of 2022.

Figure 7: National weekly death counts by cause of death[10], 01 January to 11 December 2022



Source: Ministry of Health, 11 December 2022

Figure 8: 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 04 December 2022

[10] 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.

Whole Genomic Sequencing

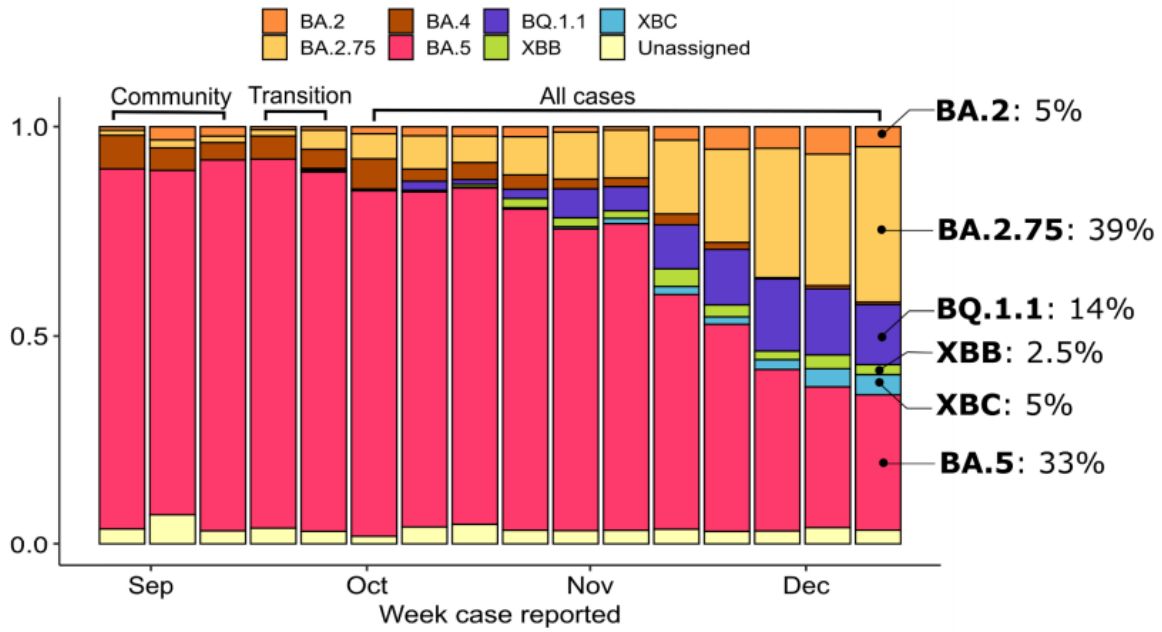
Wastewater and Community cases

Whole genomic sequencing data are updated on a fortnightly basis; the data has been updated in this week's report.

Wastewater variant analysis for the fortnight ending 11 December reports the following proportions: BA.2.75 58%, BA.4/5 19%, BQ.1.1 18%, XBC 3% and XBB 2%.

Figure 9 shows the proportions of variants in community cases, with BA.5 accounting for 33% of sequenced cases in the week to 09 December. 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 (39%), BQ.1.1 (12%), and XBC (5%). 4% of PCR-positive hospital 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 9: Proportion of Variants of Concern in community cases[11]



Source: ESR COVID-19 Genomics Insights Report #28, EpiSurv/Microreact 0900hrs 09 December 2022

[11] 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 09 December 208/540 samples were successfully sequenced. As of 09 December; 38% were BA.5, 34% BA.2.75, 17% BQ.1.1, 3% BA.2, 4% XBC, 2%, 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, 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 have demonstrated substantial immune evasion in laboratory testing compared to prior Omicron variants. Cases of these subvariants are likely to increase (as a proportion of cases) in the coming weeks. The current increase in incidence of SARS-CoV-2 infections is not driven by a single variant but is consists of a number of Omicron subvariants with increased immune evasion characteristics.

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.

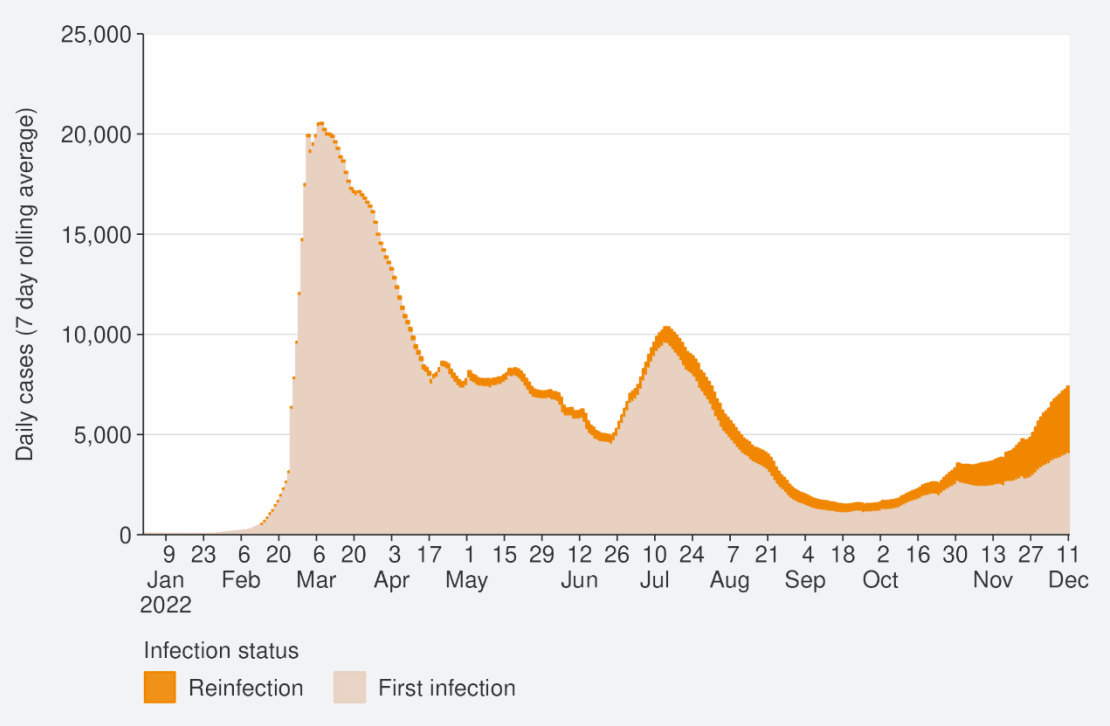
It is important to highlight that this data likely reports more on 'redetections' rather than true reinfections. True reinfections cannot be definitively captured in the data for a range of reasons. For example, a person with persistent infection due to being immunocompromised, who undergoes repeated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

Figure 10 characterises the average number of cases per week by first infection and reinfection. Reinfections made up 27.7% of reported cases in the week ending 11 December. The proportion of reported cases that were reinfections has increased in the last four weeks, after being stable in the prior weeks. **Figure 11** shows how many first infections and reinfections have been reported cumulatively over time. Cumulatively, reinfections have made up 4.2% of total cases reported in 2022. The proportion of cases that are reinfections is expected to increase over time.

Figure 12 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.

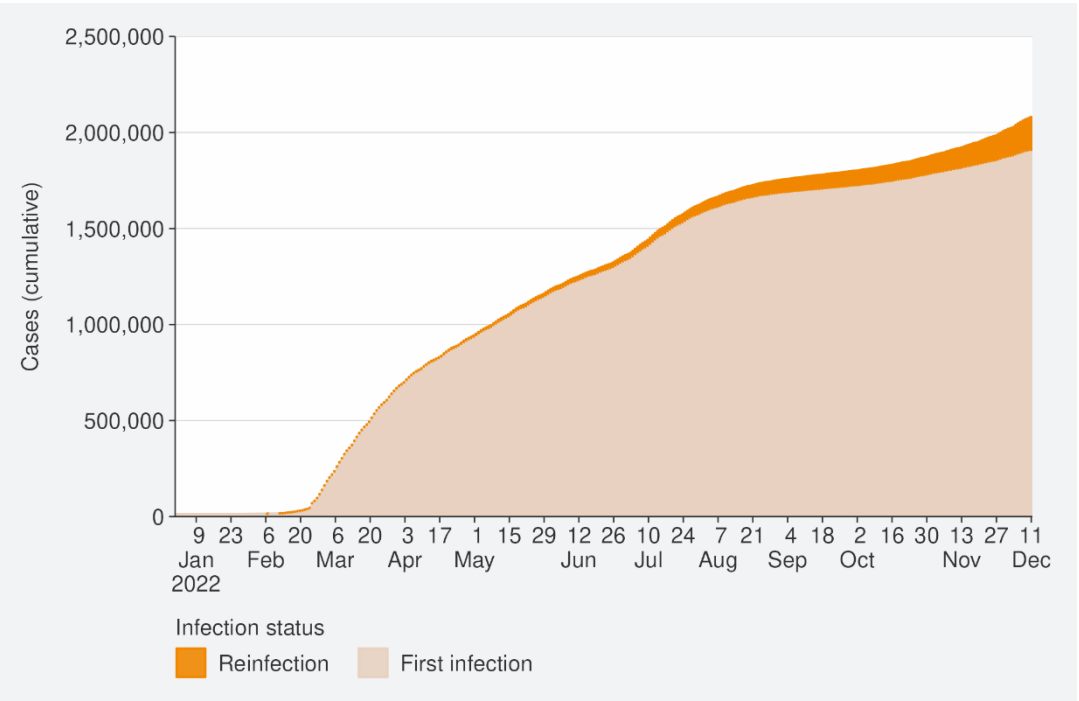
The true number of reinfections is likely higher than reported here. In general, reporting of cases is expected to decline over time. Due to under-ascertainment of the first infection and subsequent infections and, as both are required to detect a reinfection, there is likely to be under-reporting of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

Figure 10: Reinfections 7 day rolling average from 01 January to 11 December 2022



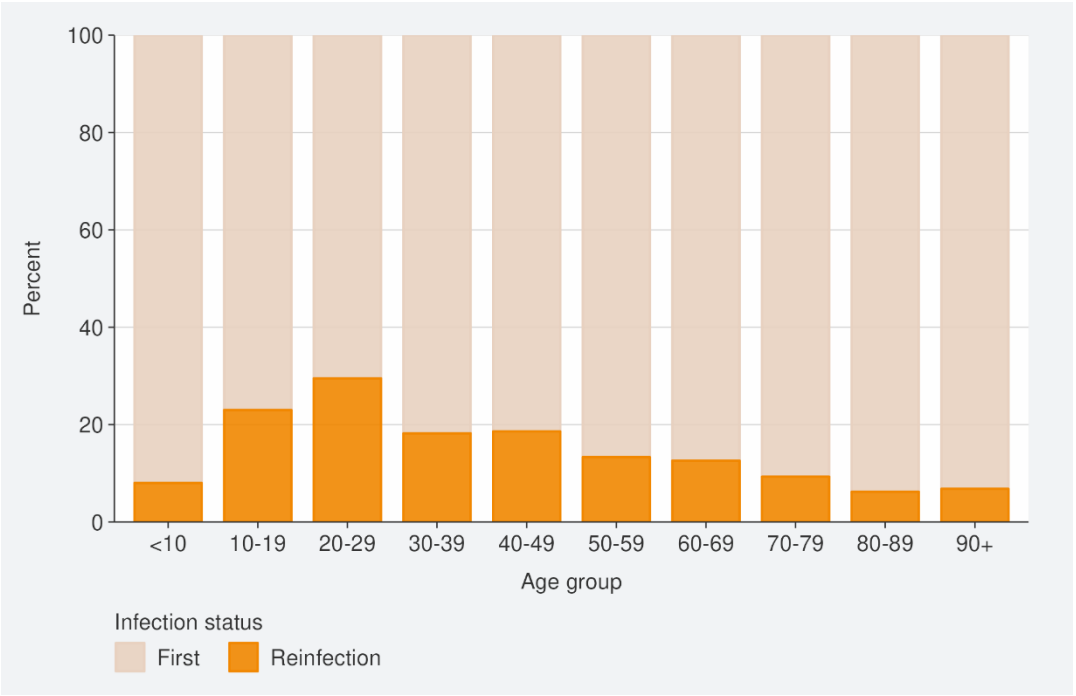
Source: NCTS/EpiSurv as at 2359hrs 11 December 2022

Figure 11: Reinfections cumulatively from 01 January to 11 December 2022



Source: NCTS/EpiSurv as at 2359hrs 11 December 2022

Figure 12: Reinfections by age group 01 January to 11 December 2022



Source: NCTS/EpiSurv as at 2359hrs 11 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 11 December. Increases compared to the previous week ending 04 December were: 16.5% Pacific peoples, 19.2% Māori, 14.9% European or Other, and 10.9% Asian (see **Figure 13**). The highest reported case rates were in Pacific peoples (115.8 per 100,000); European or Other also had a similar rate (107.2 per 100,000); Asian and Māori had the lowest rate (94.6 and 95.4 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 11 December. Rates in this age group were highest among Pacific peoples (163.1 per 100,000); followed by European or Other (126.7 per 100,000); Asian and Māori had similar case rates for those aged 25-44 (117.8 and 121.4 per 100,000 respectively). Refer to the appendix for non-age-standardised rates by ethnicity.

Figure 14 shows that the age-standardised hospitalisation rates for COVID-19 increased for all ethnicities, apart from Māori in the week ending 04 December as compared to the week prior. Pacific peoples had the highest age standardised hospitalisation rate (2.5 per 100,000) for the week ending 04 December; followed by Māori (1.7 per 100,000); Asian and European and Other had similar rates (1.3 per 100,000). For all ethnicities, those aged 80+ had the highest hospitalisation rates. Pacific peoples aged 80+ had the highest hospitalisation rate (21.2 per 100,000); followed by Asian (13.2 per 100,000); Māori and European and Other had the lowest hospitalisation rate for those aged 80+ (12.8 and 10.5 per 100,000, respectively).

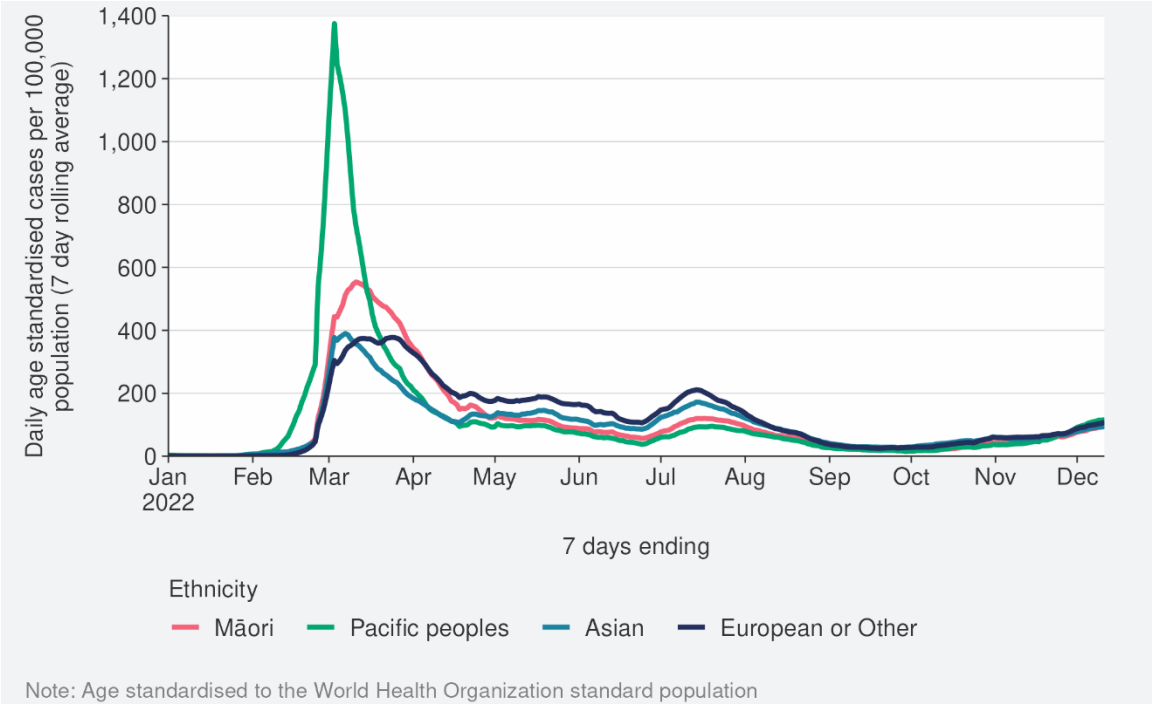
The cumulative total for the year shows that overall, Pacific peoples and Māori have had the highest risks of hospitalisation for COVID-19, 2.3 and 1.8 times the risk of European or Other, respectively for 01 January to 11 December. Asian people have had a hospitalisation rate almost 11% lower than European or Other (see **Figure 15**).

The cumulative age-standardised mortality rate for 01 January to 11 December shows that Pacific peoples have had the highest risk, 2.1 times that of European or Other, followed by Māori at 1.7 times that of European or Other. Asian people have had the lowest risk of Mortality, 41% lower than European or Other (see **Figure 16**).[12]

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.

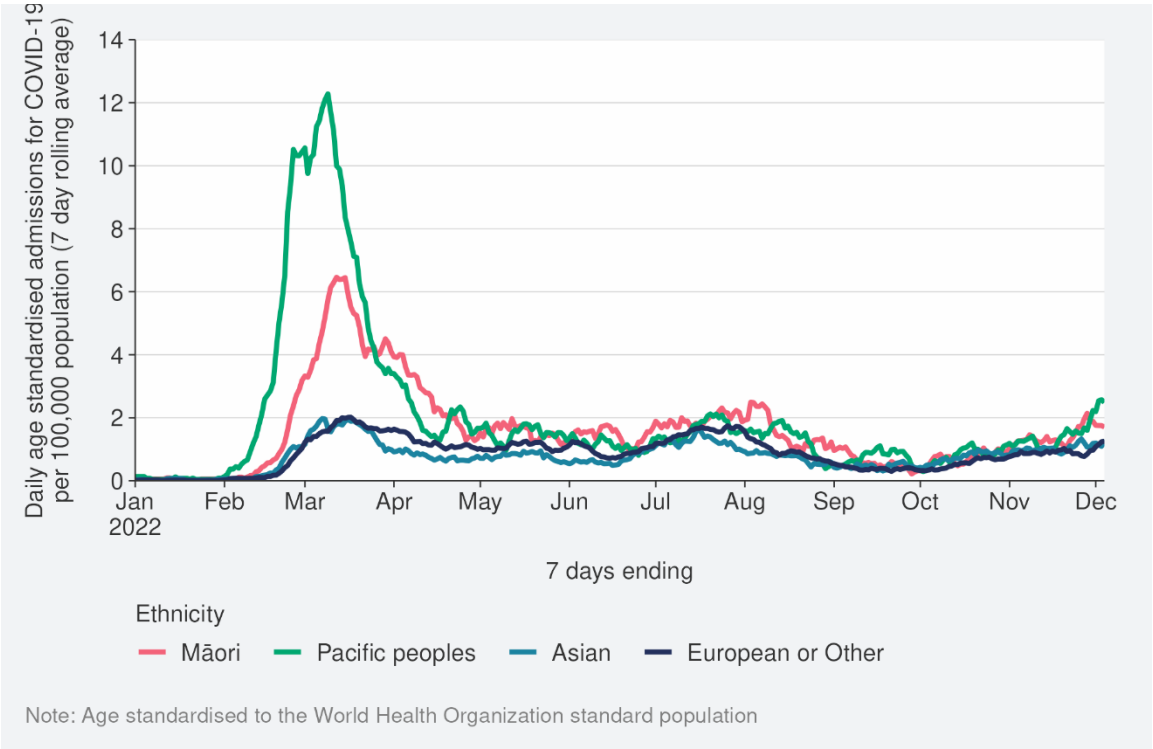
[12] These calculations are based on 2,203 deaths occurring between January 2022 and 11 December 2022

Figure 13: National age-standardised reported case rates by ethnicity from 01 January to 11 December 2022



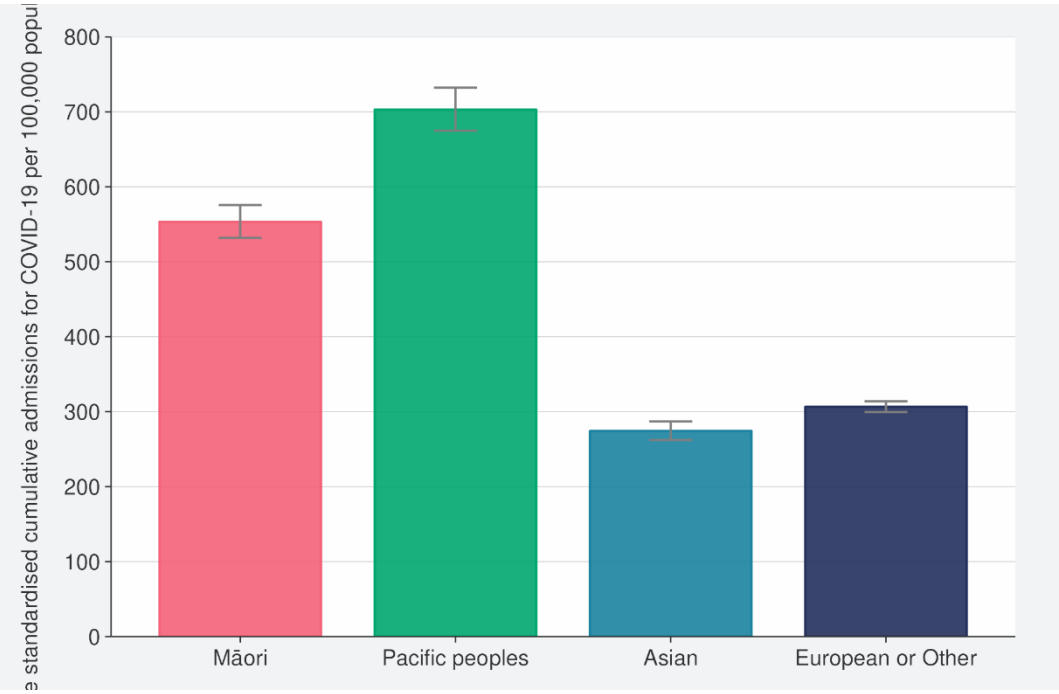
Source: NCTS/EpiSurv as at 2359hrs 11 December 2022

Figure 14: National age-standardised hospitalisation rates by ethnicity from 01 January to 04 December 2022



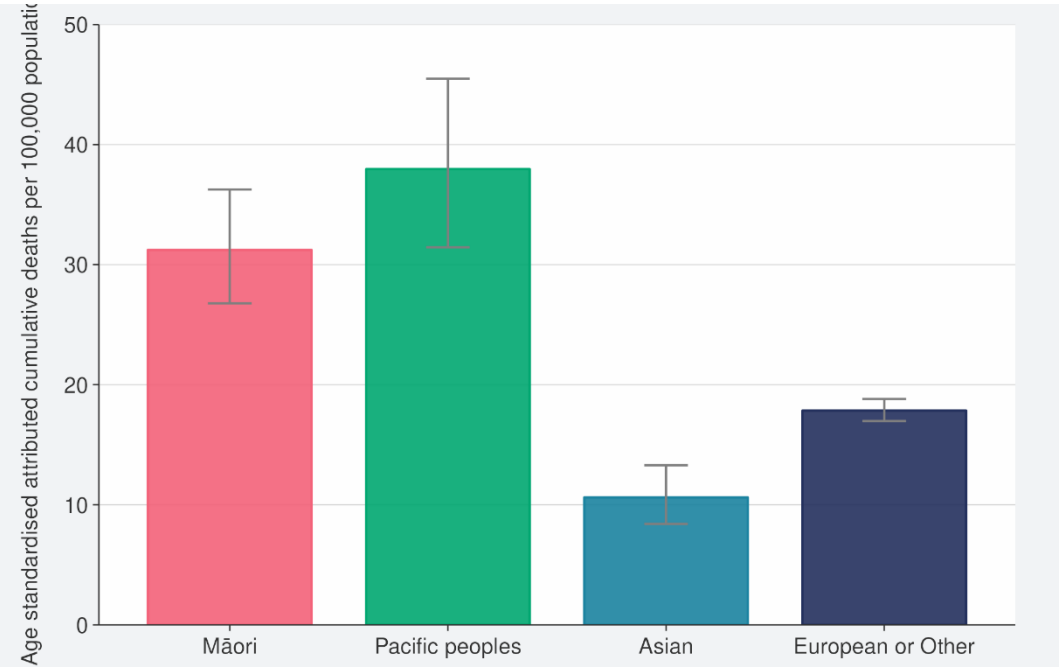
Source: NCTS/EpiSurv as at 2359hrs 04 December 2022

Figure 15: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation for COVID-19 by ethnicity, 01 January 2022 to 11 December 2022



Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, 01 January 2022 to 11 December 2022

Figure 16: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by ethnicity, 01 January 2022 to 11 December 2022



Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, 01 January 2022 to 11 December 2022

Comparison of epidemic trends by deprivation

Figure 17 shows the 7-day rolling average for reported case rates by residential area deprivation level (based on NZDep2018)[13]. Age-standardised case rates increased in all deprivation levels in the week ending 11 December. Refer to the appendix for non-age-standardised rates by deprivation.

Figure 18 shows 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 1.9 times the risk of hospitalisation compared with those who are least deprived (see **Figure 19**)

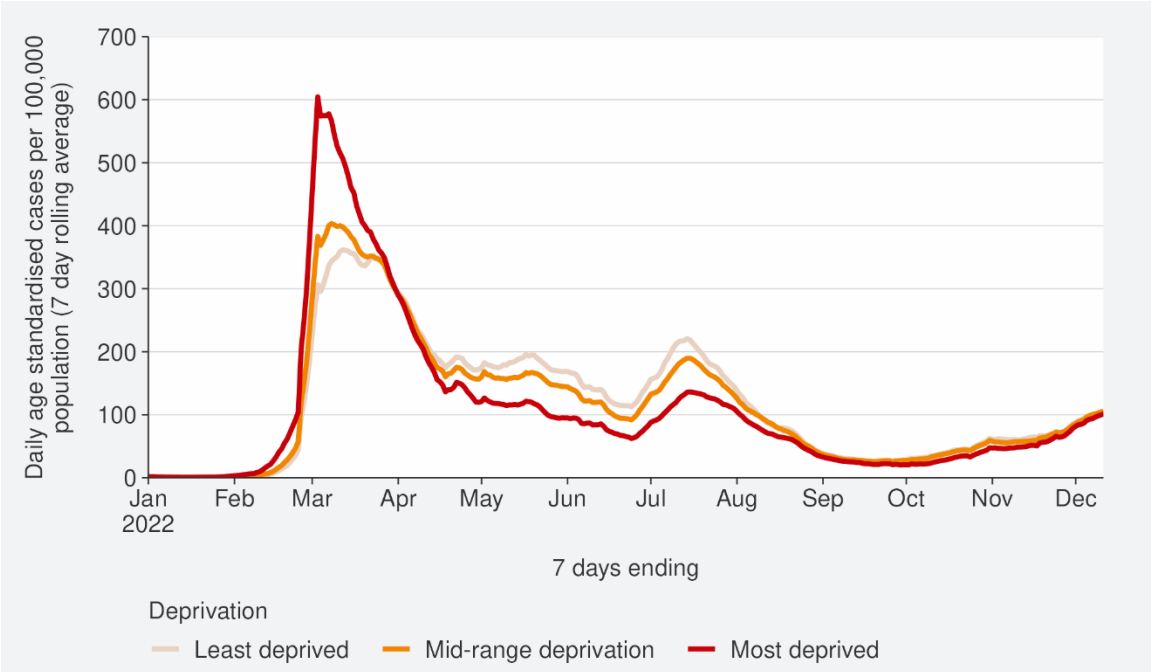
Cumulative rates of mortality are also highest for those most deprived; 2.1 times higher than the risk of those least deprived (see **Figure 20**)[14].

As lowercase 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.

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

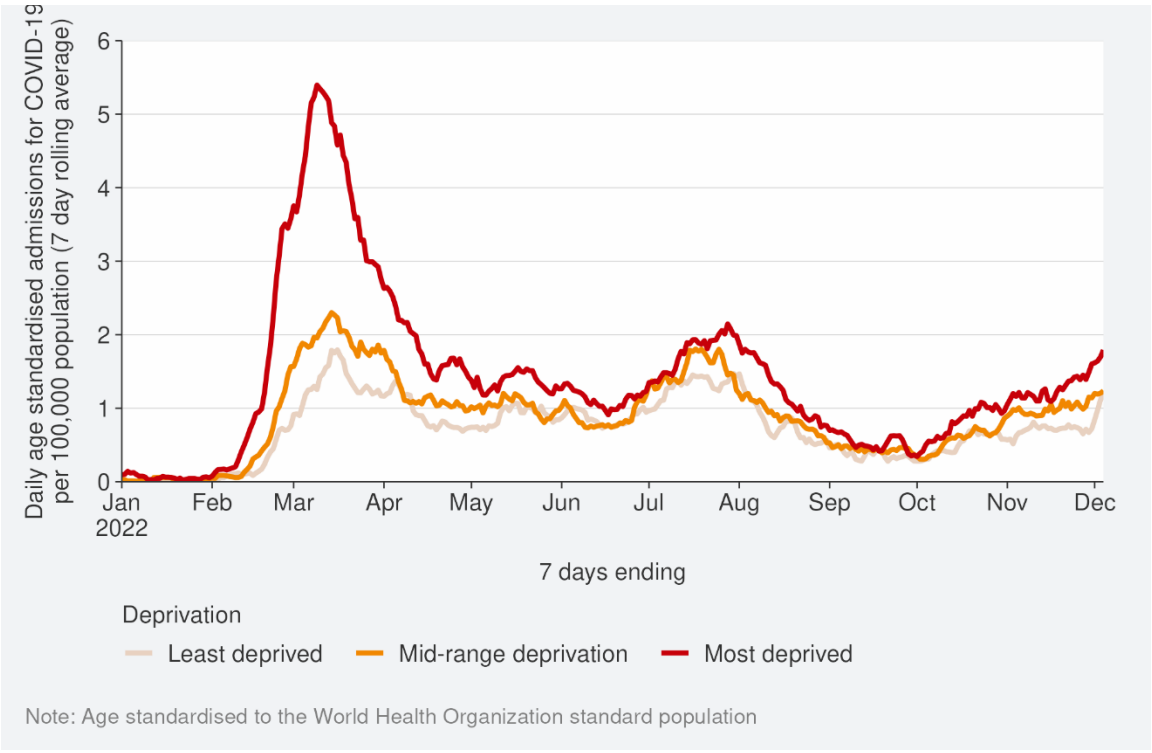
[14] These calculations are based on 2,203 deaths occurring between January 2022 and 11 December 2022.

Figure 17: National age-standardised reported case rates by deprivation status for weeks 01 January to 11 December 2022



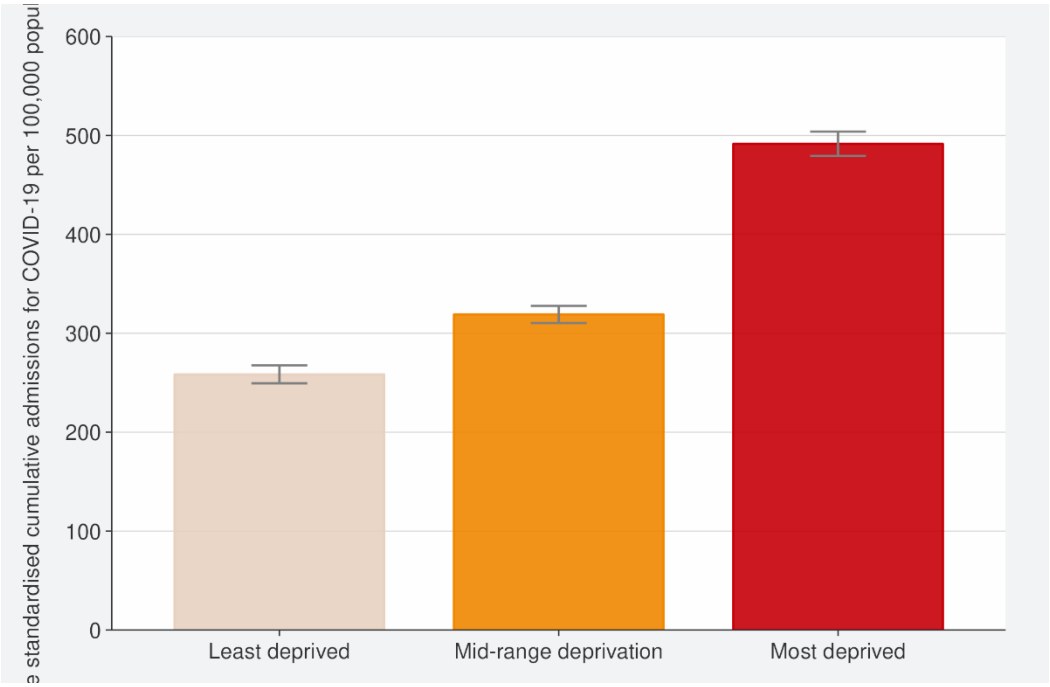
Source: NCTS/EpiSurv as at 2359hrs 11 December 2022

Figure 18: Age-standardised hospital admission rates for COVID-19 by deprivation from 01 January to 04 November 2022



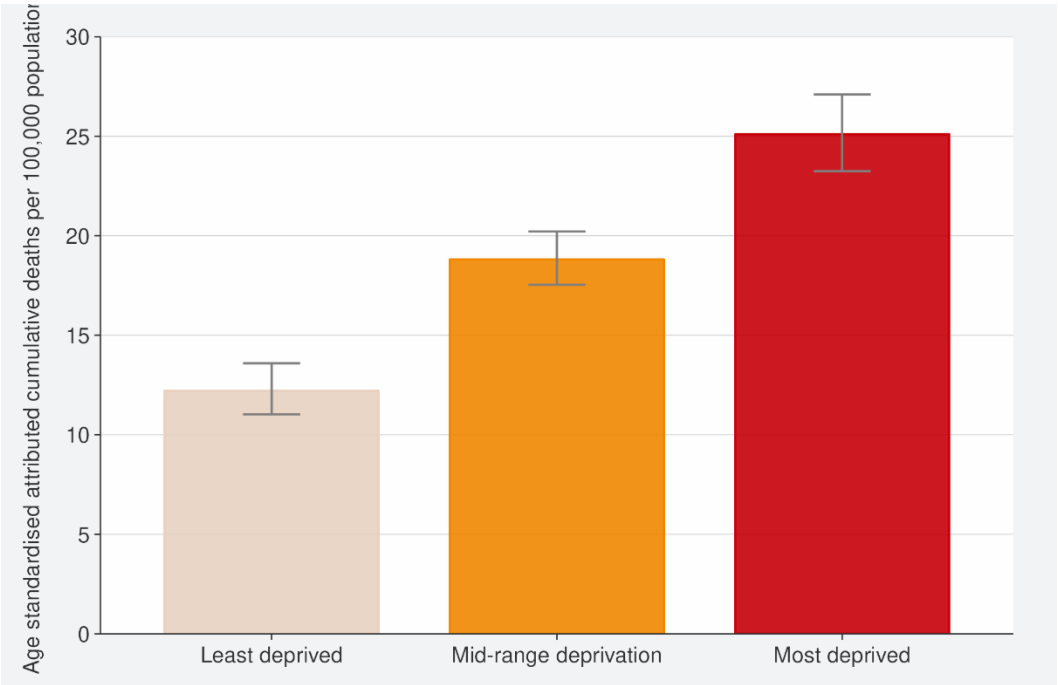
Source: NMDS/Inpatients admissions feed as of 11 December 2022 data up to 04 December 2022

Figure 19: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation for COVID-19 by deprivation, 01 January 2022 to 11 December 2022



Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates 01 January 2022 to 11 December 2022

Figure 20: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by deprivation, 01 January 2022 to 11 December 2022



Source: EpiSurv, Death Documents, The Healthcare User database, Mortality Collections database and CVIP population estimates, 01 January 2020 to 11 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 11 December, the number of new weekly cases remained stable (+2%) as compared to the previous week, with over 3.3 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 increased by 10% as compared to the previous week, with over 9,700 new fatalities reported.
- As of 11 December 2022, over 645 million confirmed cases and over 6.6 million deaths have been reported globally.
- From 14 November to 20 November 2022, the Omicron variant of concern accounted for 99.5% of sequences reported globally. Unassigned sequences (presumed to be Omicron) accounted for 9.9% 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 73.7% of sequences submitted to GISAID in the week ending 20 November 2022. During the same period, BA.4 descendent lineages declined to 2.0%; XBB and descendent lineages account for 3.9%, indicating a rising trend.
- In Australia, as of 09 December, cases and hospitalisations increased. In the 7 days to 09 December 2022, there were 764 new cases per 100,000 population. This was a 14% increase from the week prior (14 days to 02 December 2022) where there were 671 cases per 100,000 population.
- At the country level, the highest numbers of new weekly cases were reported from Japan (849,371 new cases; +13%), the United States of America (448,634 new cases; +50%), the Republic of Korea (420,392 new cases; +13%), France (366,699 new cases; -5%), and Brazil (194,170 new cases; +3%).

Sources: **Weekly epidemiological update on COVID-19 - 14 December 2022 (who.int)/ Coronavirus (COVID-19) common operating picture – 9 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 04/12/2022		Week ending 11/12/2022		% Change	Week ending 27/11/2022		Week ending 04/12/2022		% 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	**4928.7**	**94.2**	**5720.6**	**109.3**	**16.1%**	**54.9**	**1.3**	**73.3**	**1.8**	**33.6%**
Region										
Northern	1955.1	97.9	2265.6	113.4	15.9%	31.9	1.6	43.1	2.2	35.4%
Te Manawa Taki	787.3	77.0	918.6	89.8	16.7%	7.0	1.6	8.0	1.8	14.3%
Central	1013.3	103.6	1149.4	117.5	13.4%	3.3	0.7	3.9	0.8	17.4%
Te Waipounamu	1164.4	96.4	1381.4	114.4	18.6%	12.7	1.1	18.3	1.5	43.8%
Age group										
<5	127.3	41.0	143.4	46.1	12.7%	4.6	1.9	6.4	2.6	40.6%
5-14	343.4	50.6	372.9	55.0	8.6%	0.7	0.1	2.0	0.4	180.0%
15-24	641.4	98.1	738.0	112.8	15.1%	3.1	0.6	4.3	0.8	36.4%
25-44	1608.1	109.4	1859.4	126.5	15.6%	8.0	0.7	10.4	0.9	30.4%

45-64	1380.0	107.0	1583.1	122.7	14.7%	9.4	0.9	14.0	1.4	48.5%
65+	828.4	99.7	1023.7	123.3	23.6%	29.0	4.6	36.1	5.7	24.6%
Ethnicity										
Māori	620.9	77.4	737.6	92.0	18.8%	8.9	1.7	8.1	1.5	-8.1%
Pacific peoples	391.6	100.2	455.0	116.4	16.2%	5.7	1.6	8.3	2.3	45%
Asian	745.0	89.3	828.4	99.3	11.2%	8.7	1.1	9.7	1.3	11.5%
European or Other[15]	3141.6	99.2	3667.6	115.8	16.7%	31.6	1.3	46.7	1.9	48%
Deprivation										
Least deprived	1503.9	99.3	1733.7	114.5	15.3%	11.6	0.9	19.6	1.5	69.1%
Mid-range deprivation	1937.1	96.6	2249.3	112.2	16.1%	21.1	1.3	26.7	1.7	26.4%
Most deprived	1404.7	89.5	1640.9	104.6	16.8%	20.4	1.8	24.9	2.1	21.7%

[15] '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	9,686	434	34	2	22,320
Asian	Chinese	68,343	290	586	2	235,331
Asian	Indian	104,500	426	885	4	245,079
Asian	Other Asian	51,072	420	355	3	121,732
Asian	Southeast Asian	58,603	538	292	3	108,939
Māori	Māori	292,239	383	3,548	5	762,780
MELAA	African	10,619	403	127	5	26,364
MELAA	Latin American / Hispanic	14,647	505	87	3	28,998
MELAA	Middle Eastern	10,515	325	182	6	32,395
Pacific Peoples	Cook Island Māori	20,615	387	310	6	53,299
Pacific Peoples	Fijian	18,967	463	220	5	40,956
Pacific Peoples	Niuean	8,449	434	134	7	19,477
Pacific Peoples	Other Pacific Island	7,357	509	81	6	14,466
Pacific Peoples	Pacific Island NFD	1,738	474	7	2	3,663
Pacific Peoples	Samoan	72,566	468	1,154	7	154,997
Pacific Peoples	Tokelauan	3,048	444	47	7	6,863
Pacific Peoples	Tongan	31,568	434	557	8	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), 15 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). In the week ending 09 December 2022, BA.2.75 (and associated sublineages) made up 39% of all sequenced cases and is now the predominant variant. In the fortnight ending 09 December 2022 it made up 34% of sequenced 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, 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), 15 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. In the week ending 09 December 2022, BQ.1.1 made up 14% of all sequenced cases. In the fortnight ending 09 December 2022 it made up 17% of sequenced 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. (35, 73) 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), 15 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). XBB is currently present in New Zealand and is continuing to fluctuate between 1-4% of sequenced cases. In the week ending 09 December 2022, it made up 2.5% of all sequenced cases and 2% 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