COVID-19 TRENDS AND INSIGHTS REPORT

21 October 2022
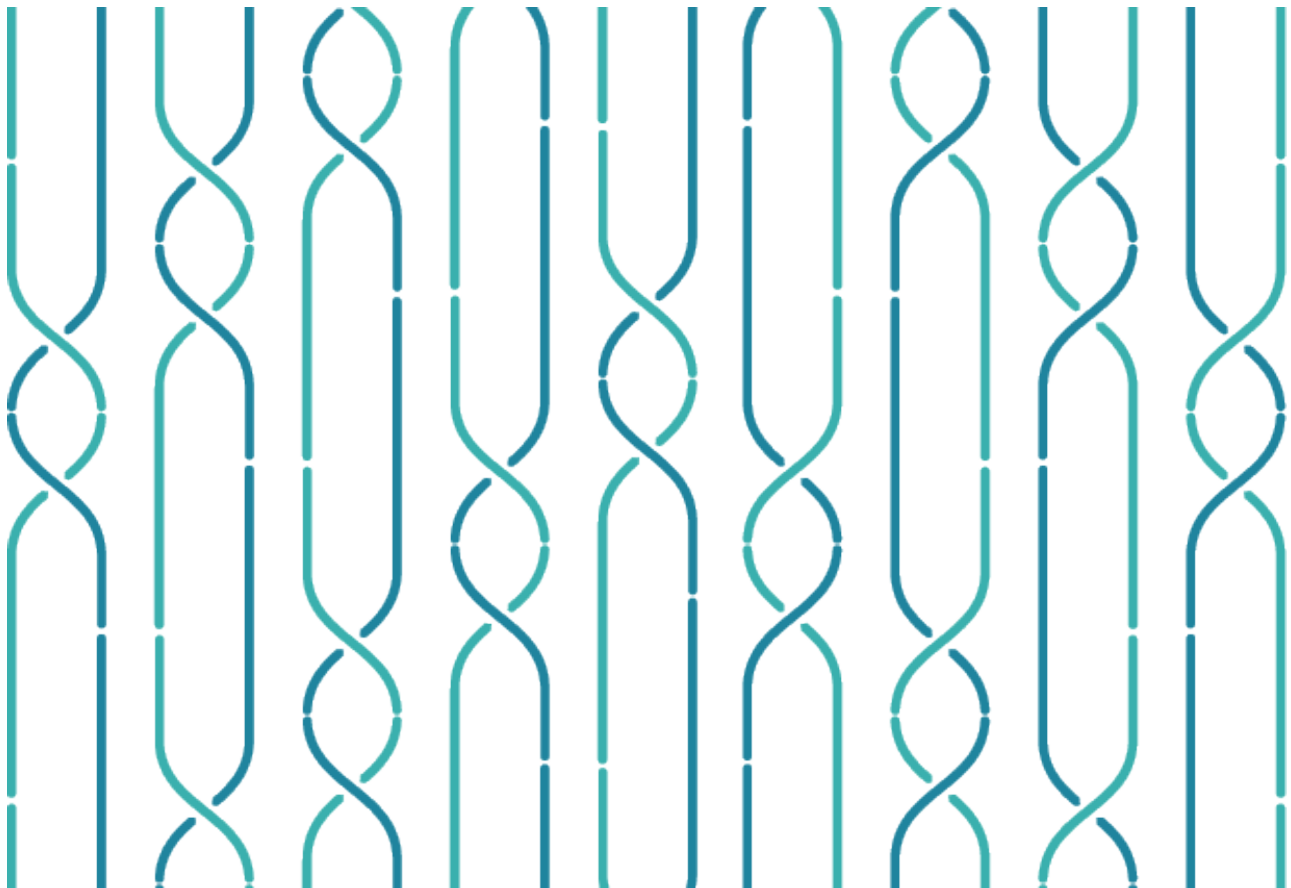
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MINISTRY OF HEALTH

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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, key measures of infection (levels of viral RNA in wastewater and reported case rates) used to monitor the COVID-19 epidemic have started to increase after two months of decline since the July peak. Hospital occupancy indicates an increase in the past week. After also decreasing significantly, hospital admission rates have now stabilised whereas mortality counts have continued to decrease; however, both measures lag behind changes in infection rates.

BA.5 was the dominant subvariant accounting for an estimated 84% of cases; this was consistent with wastewater findings. In the two weeks ending 14 October, variants BA.5, BA.4, BA.4.6 and BA.2 (including BA.2.75) were detected in community samples. The Omicron variants BQ.1 (three cases), BQ.1.1 (three cases) and the recombinant lineage, XBB (one case) were all detected this week. BQ.1.1 was also found in wastewater, but XBB has not been detected in wastewater.

Over the next fortnight, it is probable that cases, hospitalisations and mortality will increase. It is still uncertain, at this stage, what impact new variants of concern in the community will have on overall infections, hospitalisations and mortality.

Key insights

National Trends

Cases	The 7-day rolling average of reported case rates was 41.1 per 100,000 population for the week ending 16 October. This was a 27.7% increase from the previous week, which was 32.2 per 100,000.
Wastewater	Wastewater quantification indicated an increase in transmission in the past fortnight and suggests a 30-40% case under-ascertainment in the past week.
Hospitalisations	The COVID-19 hospital admissions rate has been decreasing since the mid-July 7-day rolling average peak of 2.5 per 100,000 to a 7-day rolling average of 0.7 per 100,000 for the week ending 9 October.
Mortality	As of 16 October, there were 2,060 deaths attributed to COVID-19 in 2022. The weekly number of deaths attributed to COVID-19 has continued to decrease.
Variants of Concern	Based on individual WGS, BA.5 accounts for 84% of sequenced community cases seen in the last week (08 October to 14 October), followed by BA.4.6 (6% of cases), BA.2.75 (4% of cases), and BA.4 (2% of cases).
	Wastewater variant analysis for week of 16 October reports the following proportions: BA.4/5 87%, BA.1/BA.2.75 9% and BQ.1.1 4%.

Māori

Cases	The 7-day rolling average of reported case rates was 23.8 per 100,000 population on 16 October, lower than for European or Other, however there may be case ascertainment biases.
Hospitalisations	The age-standardised Māori cumulative hospitalisation rate for COVID-19 is 1.8 times higher than European or Other.
Mortality	The age-standardised cumulative mortality rate for Māori is 2.0 times higher than European or Other.

Pacific peoples

Cases	The 7-day rolling average of reported case rates was 28.3 per 100,000 population on 16 October; lower than for European or Other, however there may be case ascertainment biases.
Hospitalisations	Pacific peoples have the highest cumulative rate of hospitalisation with COVID-19 which is approximately 2.3 times higher than European or Other.
Mortality	Pacific peoples have the highest age-standardised cumulative mortality risk of any ethnicity, 2.4 times that of European or Other.

International Insights

Globally, in the week ending 16 October, the number of new weekly cases decreased by 6% as compared to the previous week, with over 2.9 million new cases reported. The number of new weekly deaths decreased by 17% compared to the previous week, with over 8,300 fatalities reported.

Globally, from 17 September to 17 October 2022, 98,731 SARS-CoV-2 sequences were submitted to GISAID, with Omicron accounting for 99.7% of sequences.

The Omicron variant XBB is currently driving a wave in Singapore. More detail in the Global pandemic summary.

In Australia, cases in NSW have been increasing, cases in Victoria have been decreasing. Omicron variant BQ.1.1 is accounting for approximately 5% of cases in NSW in the most recent data.

National summary of epidemic trends

Case trends

Evidence supports an increase in incidence in the community: reported[1] case rates and levels of viral ribonucleic acid (RNA) in wastewater have been increasing since 02 October after both measures were relatively constant in the recent weeks to 25 September (see **Figure 1**). Comparison of reported case rates and wastewater RNA levels suggest approximately 55% of infections have been reported as cases in the past week, and in the week prior this was 70%.

Reported cases are now tracking slightly above the modelled median rate. Modelling scenarios accounting for changes in masking and contact quarantine on 12 September and assume no new variants, indicate case rates are expected to remain stable or slightly increase in the coming months (see **Figure 2**)[2].

The general population reported case rate for the week ending 16 October was 41.1 per 100,000, a 27.7% increase from the previous week (32.2 per 100,000). The case rate was highest in Central region (50.1 per 100,000), having increased by 50.3% and lowest in Te Manawa Taki (31.8 per 100,000), having increased by 8.3% compared to the week prior (see **Figure 3**).

Increases were seen in all age groups. The reported case rate increased 43.4% to 52.4 per 100,000 in those aged 65 years and older; this was the largest increase and the highest rate across all age groups. The lowest rate was among 5–14-year-olds (14.6 per 100,000) (see **Figure 4**).

Table 1 in the appendix provides information on specific rates.

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[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.

[2] See the online glossary for modelling assumptions.

Figure 1: National wastewater trends (SARS-CoV-2 genome copies)[3] compared with reported cases
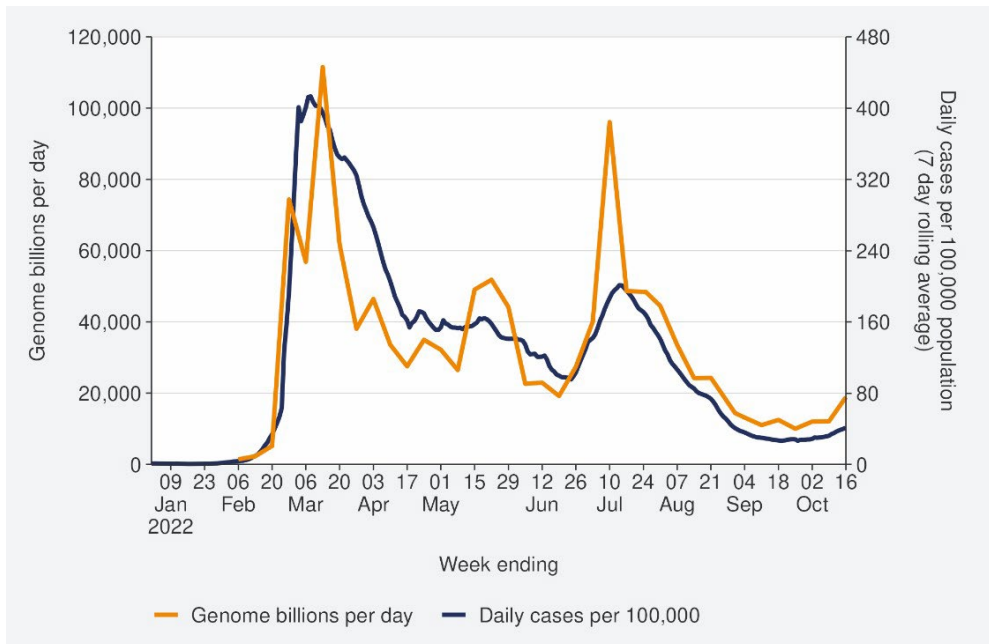
Sources: ESR SARS-CoV-2 in wastewater update for week ending 16 October 2022 and NCTS/EpiSurv as at 2359hrs 16 October 2022

Figure 2: COVID-19 Modelling Aotearoa scenarios[4] compared with national reported case numbers
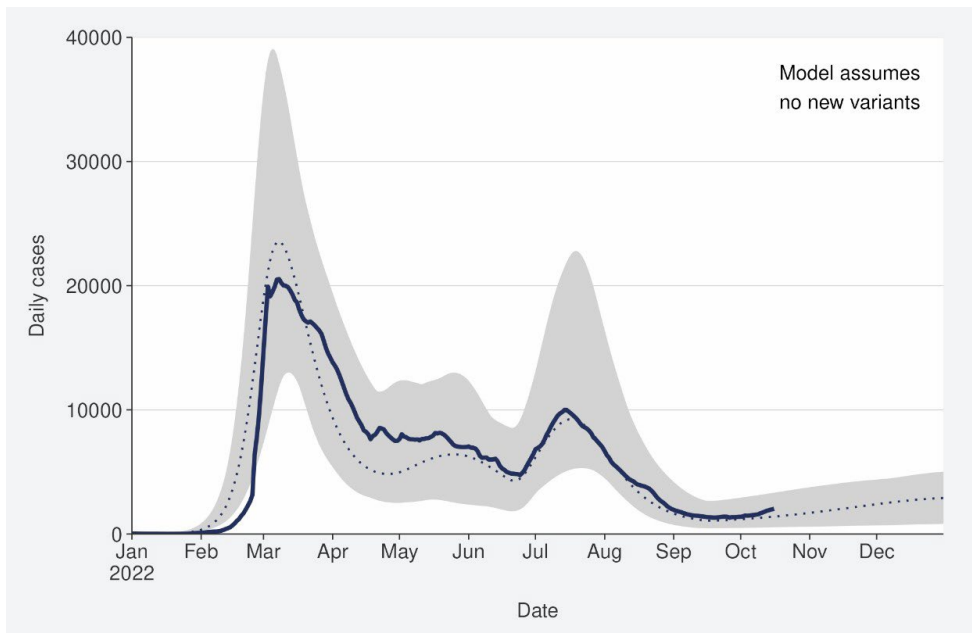
Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, September 2022, and NCTS/EpiSurv as at 2359hrs 16 October 2022

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

[4] The 'July' BA.5 scenario assumes previous infection provides greater protection against reinfection and severe disease, 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 January to 16 October 2022
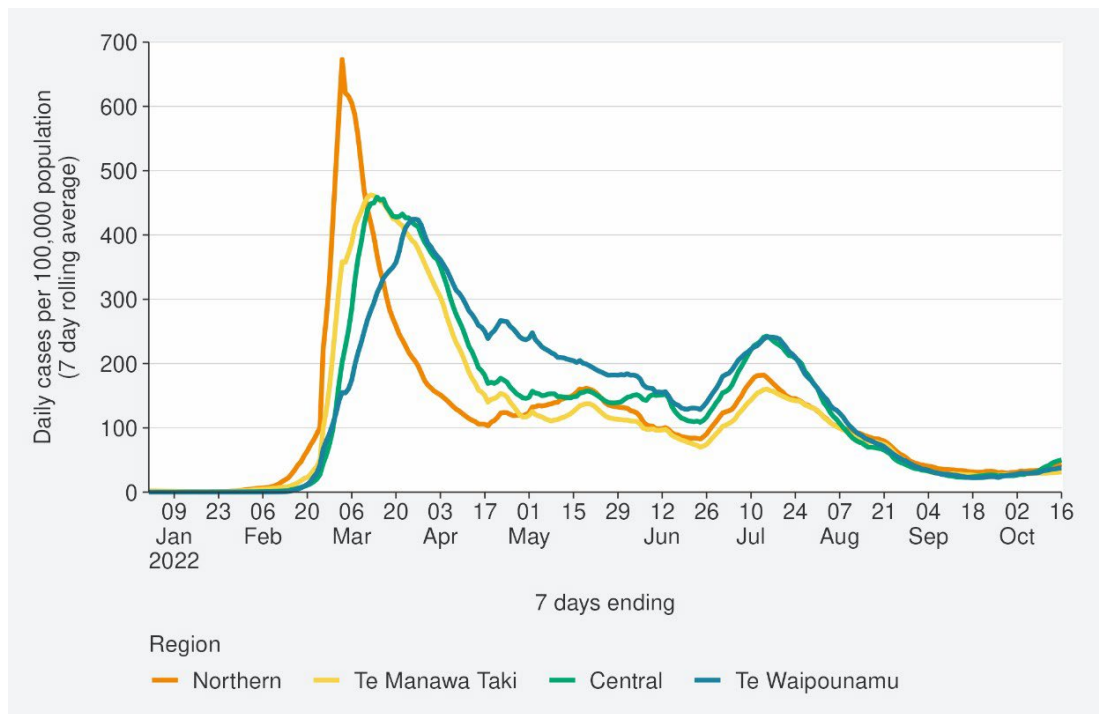
Source: NCTS/EpiSurv as at 2359hrs 16 October 2022

Figure 4: National reported case rates by age from January to 16 October 2022
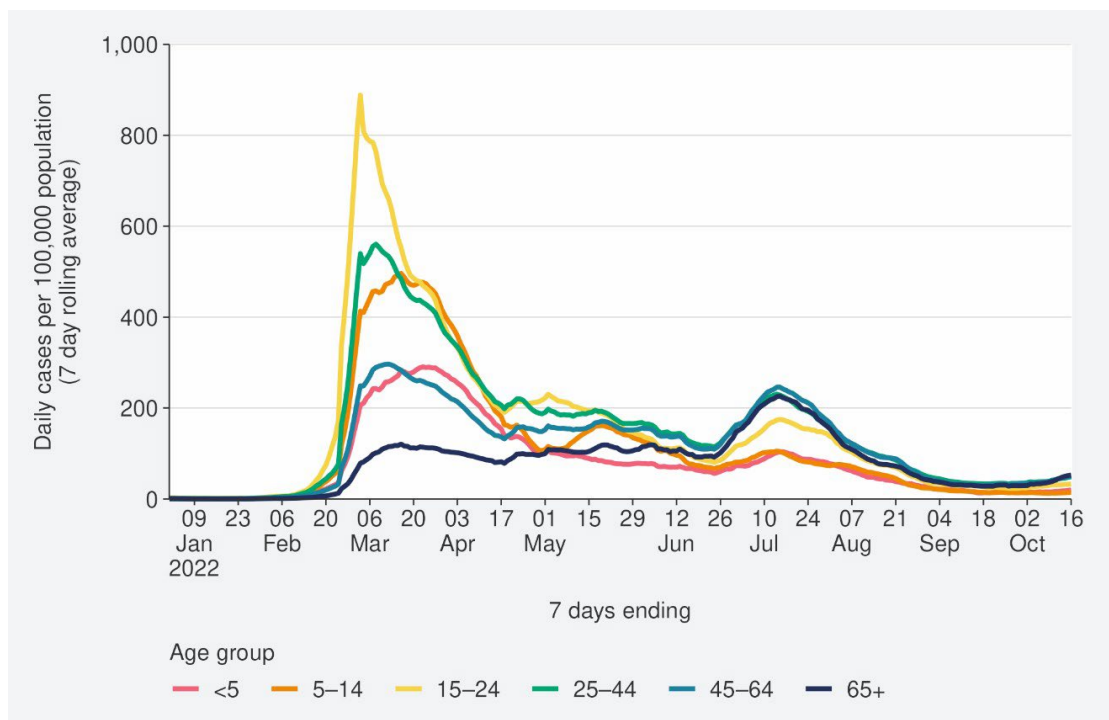
Source: NCTS/EpiSurv as at 2359hrs 16 October 2022

Hospitalisation and mortality trends

Hospitalisation

As seen in **Figure 5**, the national COVID-19 hospital admissions rate "for" COVID-19 has been decreasing since mid-July, but has remained stable in the last month, with a 7-day rolling average of 0.7 per 100,000 population for the week ending 16 October.[5] Despite case rates in the most recent July peak being half that of the March peak (201.2 and 413.2 per 100,000, respectively), the hospitalisation rate in the July peak was only slightly lower than the hospitalisation rate in March. This can be explained by the strong association between age and poor outcomes after infection. The reported case rates in those aged >65 years peaked at 75% higher in July than in March (refer back to **Figure 4**).

Modelling scenarios suggest current hospital occupancy is tracking towards the higher range of the prediction and is expected to slightly increase in the coming months (see **Figure 6**).

Figure 5: National[6] hospital admissions rate for COVID-19, February to 16 October 2022
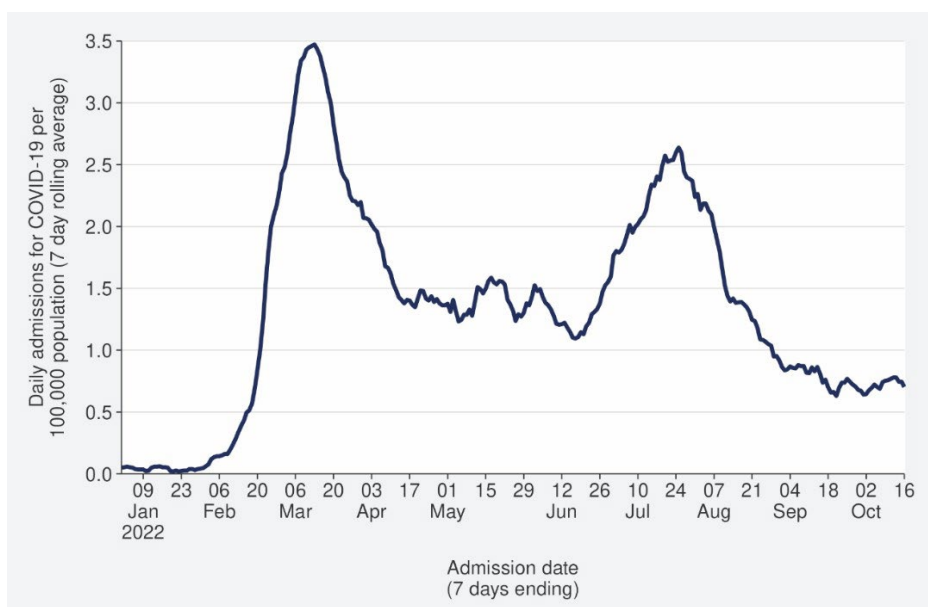
Source: NMDS/Inpatient's admissions feed as of 18 October 2022 data up to 16 October 2022

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[5]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.

[6] 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 occupancy[7] scenario[8] compared with national observed occupancy
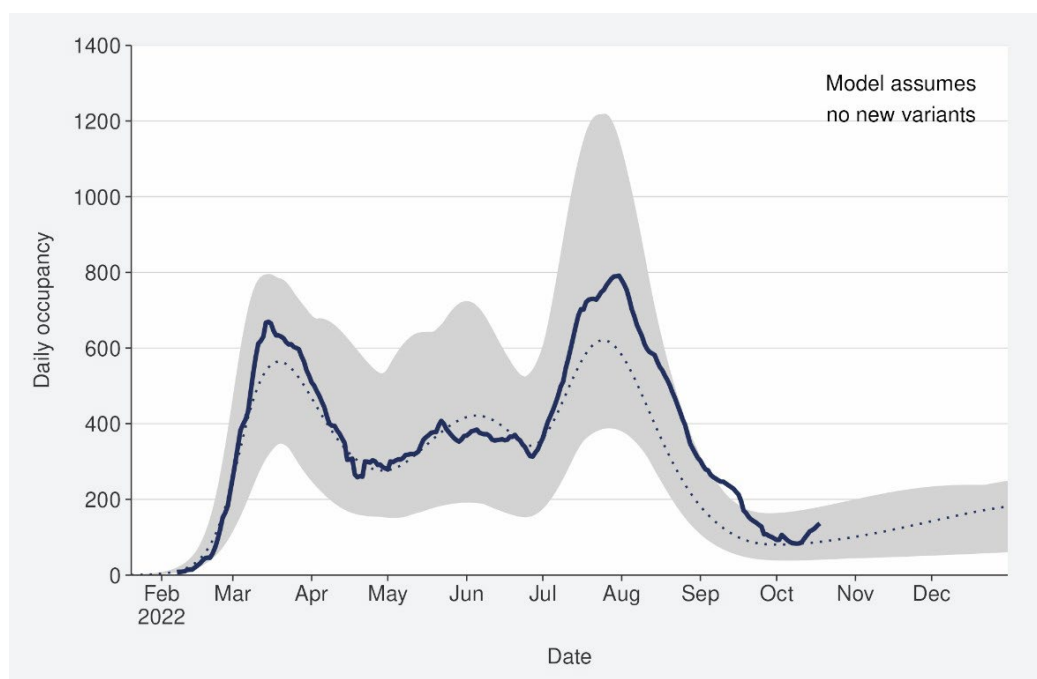
Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, September 2022, and Ministry of Health reported hospital occupancy data 16 October 2022

Mortality

From the first week of January to 16 October 2022, there were 3,066 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 in 2022 that have been formally coded by cause of death, 1,264 (47%) were determined to have COVID-19 as the main underlying cause. COVID-19 contributed to a further 750 (28%) deaths and another 687 (25%) people died of an unrelated cause (**Figure 7**). Deaths have declined and stabilised since peaking in the last week of July, when just over 150 people died with COVID-19 as their underlying or contributing cause. As seen with hospitalisations, due to the strong association of increasing age and increasing mortality risk, the patterns in mortality over time strongly reflect the case rates in those aged >65 years.

Deaths are currently tracking below the lower range of the modelled scenario and are predicted to slightly increase in the coming months (see **Figure 8**).

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[7] These data are for all hospital occupancies with COVID-19, including those that were incidental, such as injuries.

[8] The 'July' scenario assumes previous infection provides greater protection against reinfection and severe disease, 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.

[9] There were 55 deaths before the first week of 2022.

Figure 7: National weekly death counts by cause of death[10], February to 16 October 2022
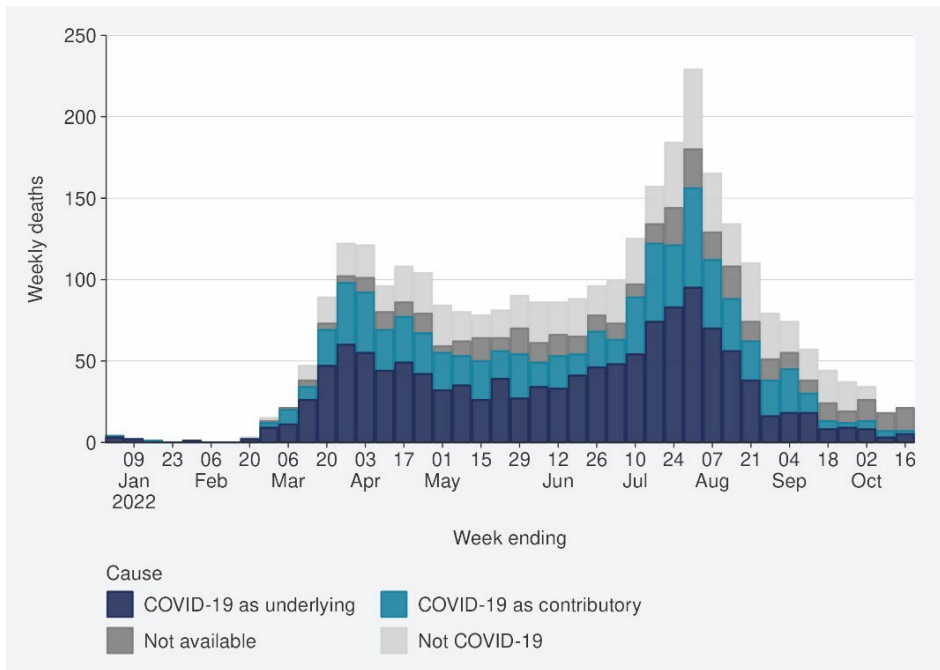
Source: Ministry of Health

Figure 8: COVID-19 Modelling Aotearoa death count compared with national observed deaths attributed to COVID-19
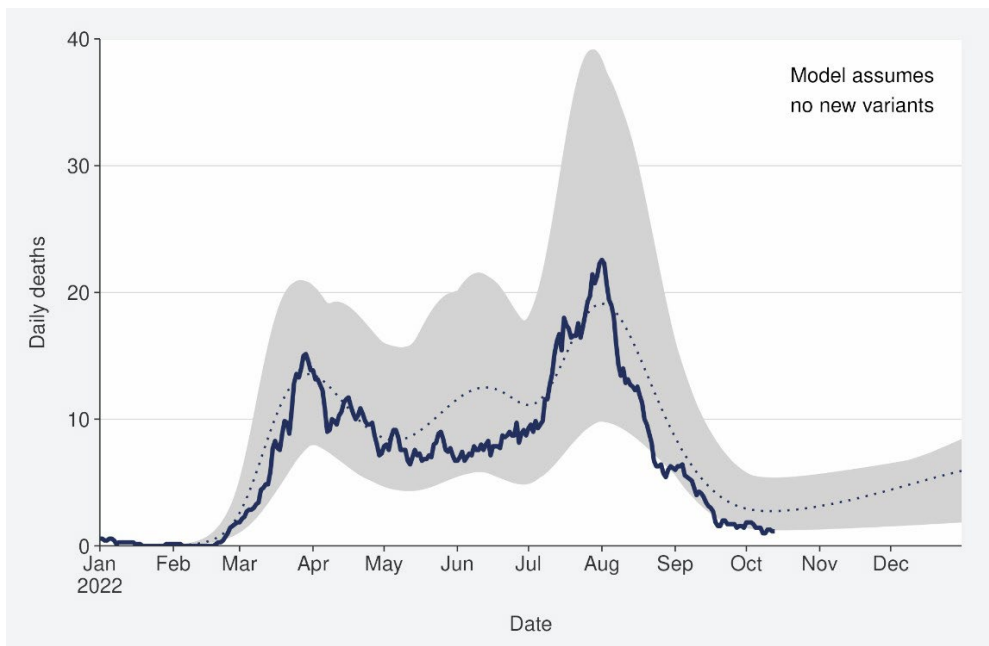
Sources: COVID-19 Modelling Aotearoa, ordinary differential equation model, September 2022, and Ministry of Health reported attributed deaths data 16 October 2022

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[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

Community cases and wastewater

Whole Genomic Sequencing data is updated on a fortnightly basis; the data have been updated for this week's report.

Figure 9 shows the proportions of variants in community cases, with BA.5 accounting for 84% of sequenced cases in the week to 14 October. Proportions of the BA.5 subvariant in the community have remained constant over the last few weeks. Watchlist variants BA.2.75 (4%) and BA.4.6 (6%) continue to be detected; the changes in community sequencing were likely driven by the loss of distinction between border and community cases due to COVID-19 Protection Framework changes. Patterns in wastewater remained similar to previous weeks with BA.4/5 accounting for 91% of variants detected.

In the two weeks to 14 October, the Omicron variants BQ.1.1 and XBB were also detected in community samples with three BQ.1 cases, three BQ.1.1 cases and one case caused by the recombinant lineage XBB. BQ.1.1 was also detected in wastewater, but XBB has not been detected in wastewater yet.

Figure 9: Proportion of Variants of Concern in community cases
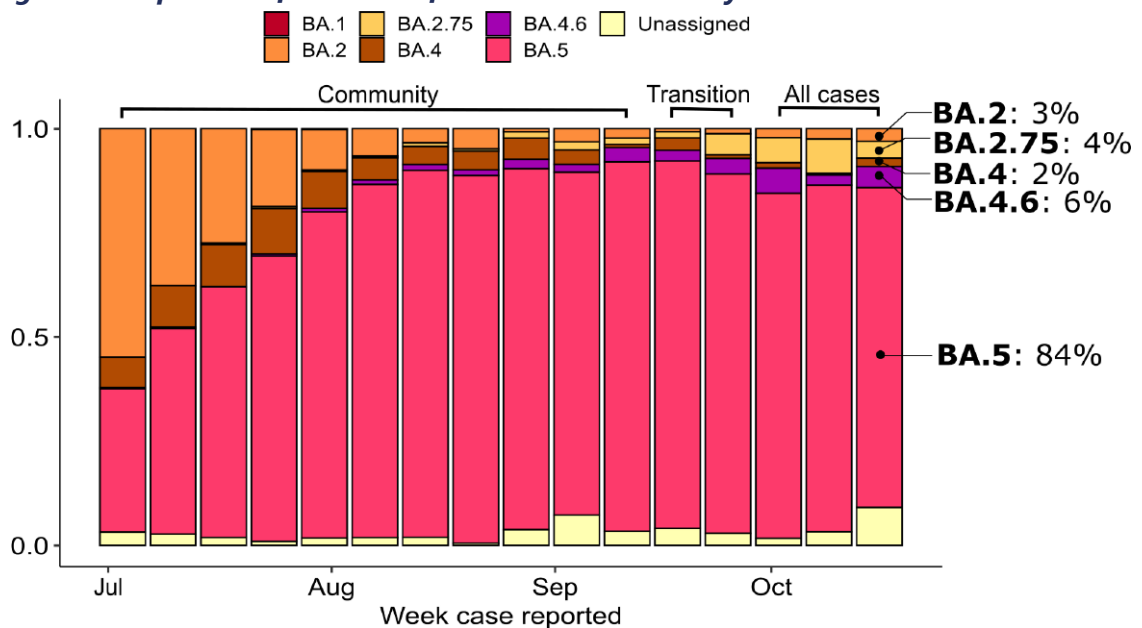
Source: ESR COVID-19 Genomics Insights Report #23, EpiSurv/Microreact 0900hrs 14 October 2022

Hospitalised cases

During the current reporting period, a Ministry of Health review identified a coding issue affecting the identification and reporting of COVID-19 hospitalisation data. As a result, in this reporting period, we are not able to determine the WGS composition of hospitalised cases.

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.

'Reinfection' in general 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. Technically these data report 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, in reality, they may be a chronic or persistent infection.

Figure 10 characterises the average number of cases per week by first infection and reinfection. Reinfections made up 10.2% of reported cases in the week ending 16 October. The proportion of reported cases that were reinfections has been stable in the past six weeks. **Figure 11** shows how many first infections and reinfections have been reported cumulatively over time. Cumulatively, reinfections have made up 2.3% of total cases reported in 2022. The proportion of cases that are reinfections is expected to increase over time. 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.
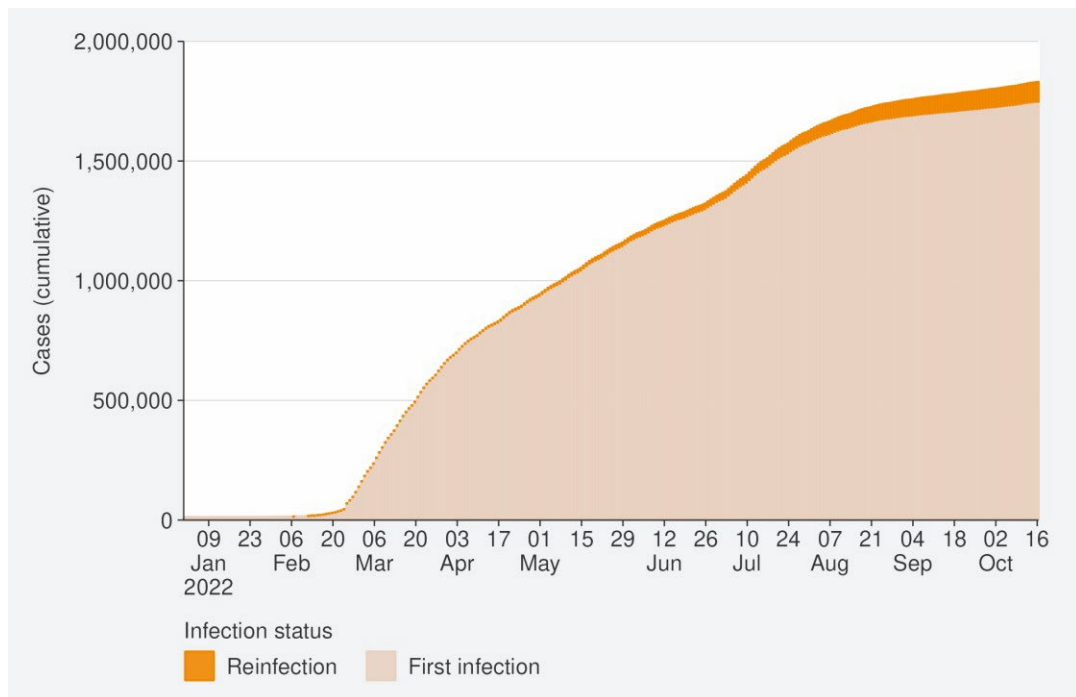
Figure 10: Reinfections 7 day rolling average from 01 January to 16 October 2022
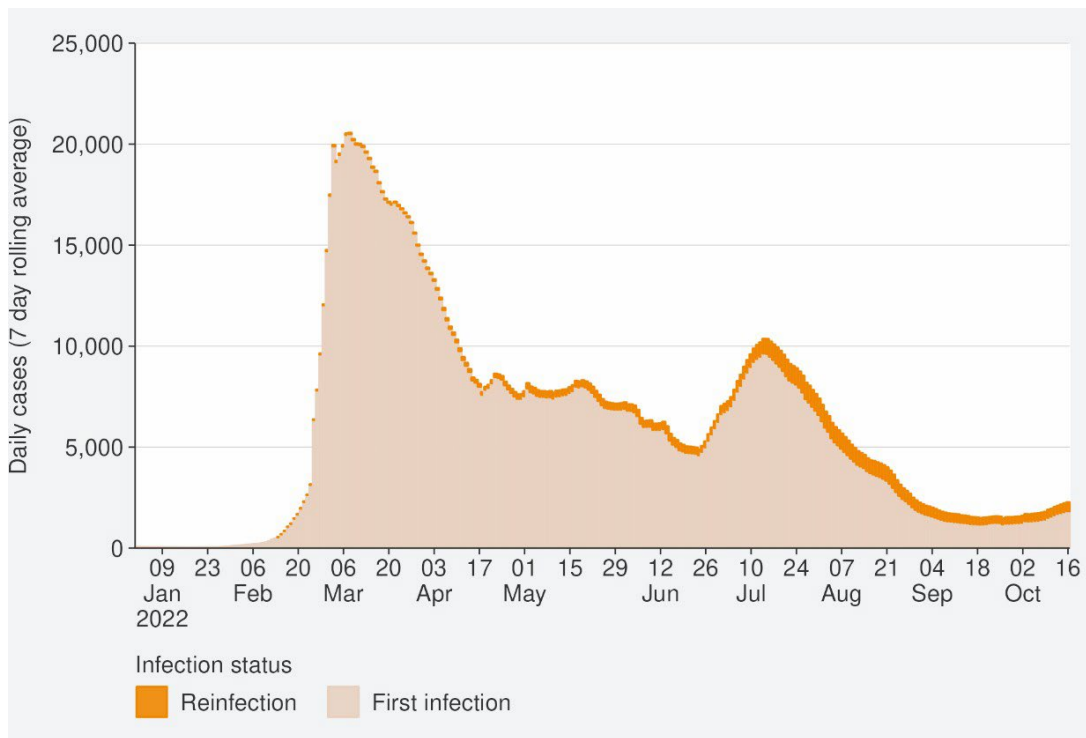
Source: NCTS/EpiSurv as at 2359hrs 16 October 2022

Figure 11: Reinfections cumulatively from 01 January to 16 October 2022

Source: NCTS/EpiSurv as at 2359hrs 16 October 2022

Comparison of epidemic trends by ethnicity

The age-standardised reported case rates have increased for all ethnicities (see **Figure 12**); with rates between 23.8 and 47.2 per 100,000 population. The highest case rates were in Asian and European or Other (47.2 and 37.1 per 100,000 respectively); lowest in Māori and Pacific peoples (23.8 and 27.2 per 100,000, respectively). Refer to **Table 1** and **Table 2** in the appendix for non-age-standardised rates by ethnicity.

Figure 13 shows that the age standardised rates for hospitalisation for COVID-19 declined or remained stable for all ethnicities in the week ending 16 October. Asian and Pacific peoples had the highest hospitalisation rate in the week ending 16 October, approximately 2-fold higher than Māori and European or Other.

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 16 October. Asian ethnicity has had a hospitalisation rate approximately 10% lower than European or Other (**Figure 14**).

The cumulative age-standardised mortality rate for 01 January to 02 October shows that Pacific peoples have had the highest risk, 2.4 times that of European or Other, followed by Māori at 2.0 times that of European or Other. Asian people have had the lowest risk of Mortality, 32% lower than European or Other (see **Figure 15**).[11]
The lower reported case rates and 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.

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[11] These calculations are based on 1,896 deaths occurring between January 2022 and 02 October 2022 (excludes deaths in the last 2 weeks and deaths where ethnicity was unknown).

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Figure 12: National age-standardised reported case rates by ethnicity from January to 16 October 2022
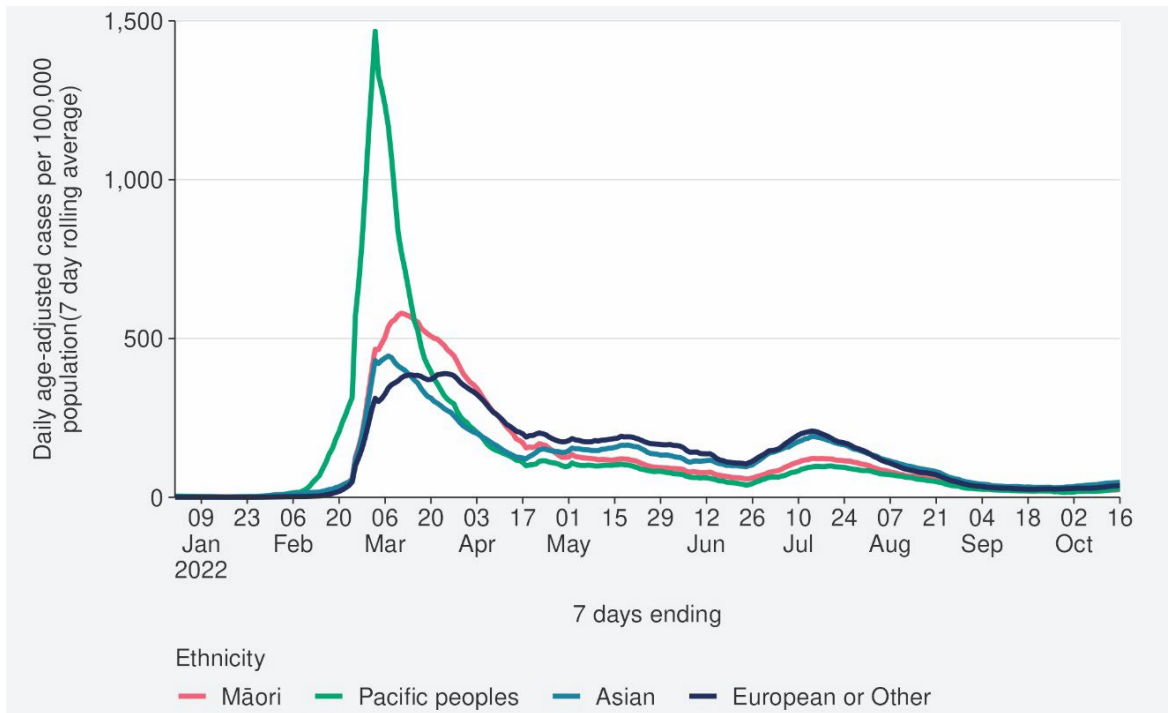
Source: NCTS/EpiSurv as at 2359hrs 16 October 2022

Figure 13: National age-standardised hospitalisation rates by ethnicity from January to 16 October 2022

Source: NCTS/EpiSurv as at 2359hrs 16 October 2022

Figure 14: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation for COVID-19 by ethnicity, 01 January 2022 to 16 October 2022
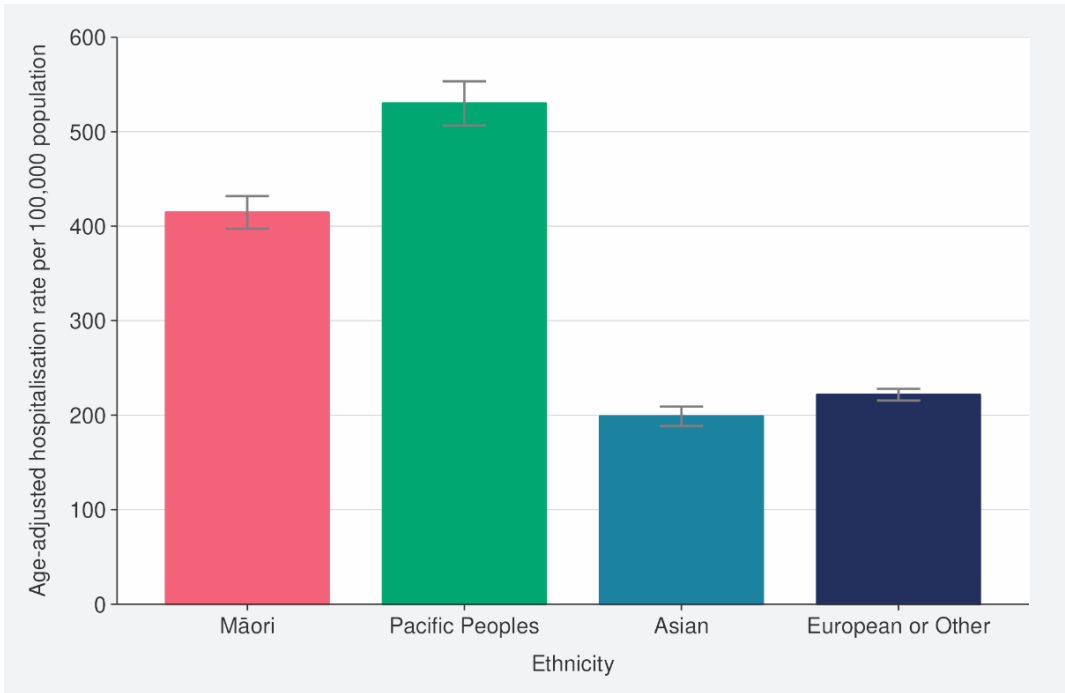
Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, 01 January 2022 to 16 October 2022

Figure 15: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by ethnicity, 01 January 2022 to 02 October 2022
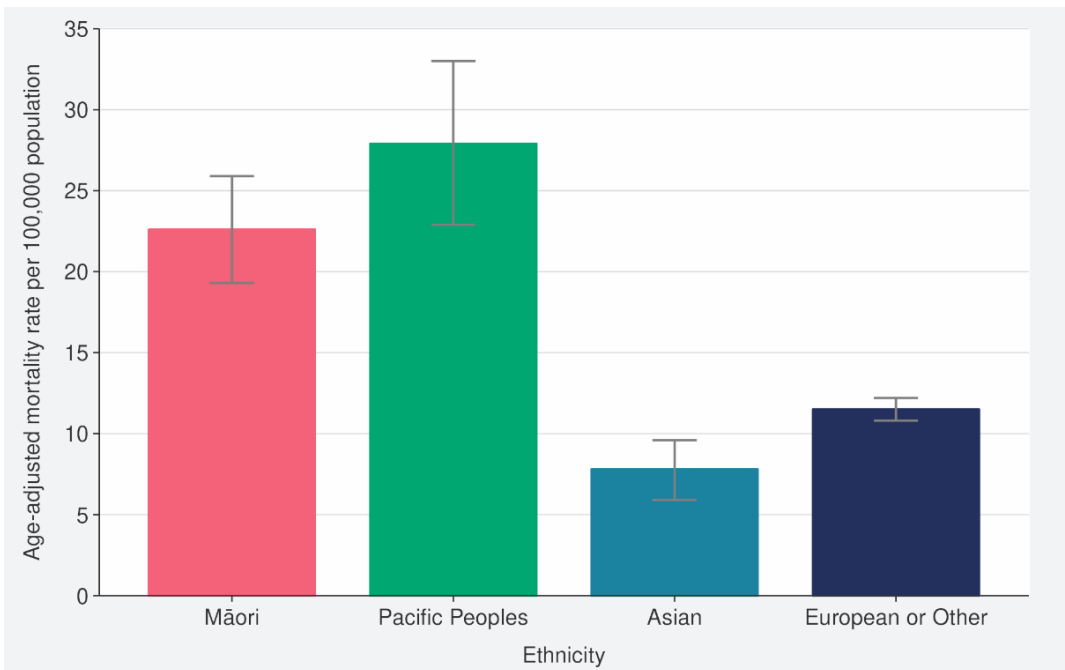
Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates, 01 January 2022 to 02 October 2022

Comparison of epidemic trends by deprivation

Figure 16 shows the 7-day rolling average for reported case rates by residential area deprivation level (based on NZDep2018)[12]. Age-standardised rates for all deprivation levels increased in the week ending 16 October. Rates in the past week were slightly higher in areas of least and mid-range deprivation. The differences were more substantial during July where those most deprived had the lowest rate. Prior to May, case rates in those most deprived were higher than the mid-range and least deprived groups. Refer to **Table 1** in the appendix for non-age-standardised rates by deprivation.

However, **Figure 17** and **Figure 18** 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 2.1 times the risk of hospitalisation compared with those who are least deprived.

Cumulative rates of mortality are also highest for those most deprived (**Figure 19**).[13]

As lower case rates have been reported among those most deprived, their 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.

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

[13] These calculations are based on 1,833 deaths occurring between January 2022 and 02 October 2022 (excludes deaths in the last 2 weeks and deaths where the level of deprivation was unknown).
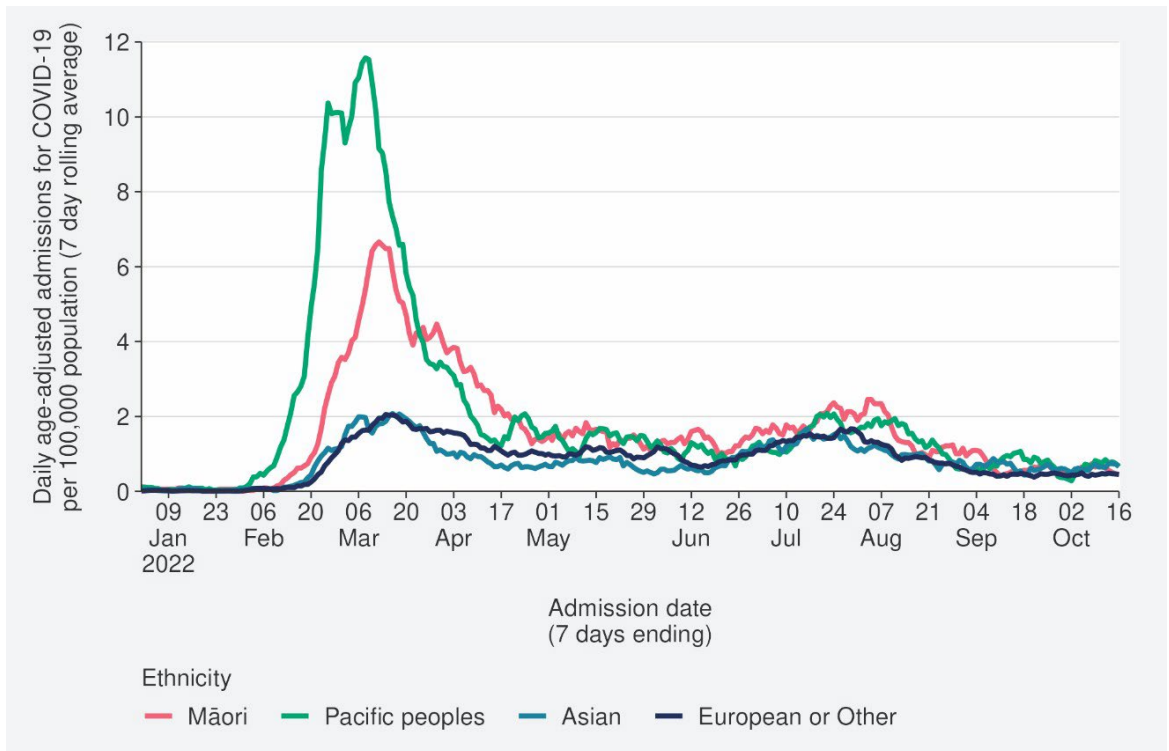
Figure 16: National age-standardised reported case rates by deprivation status for weeks 01 January – 16 October 2022
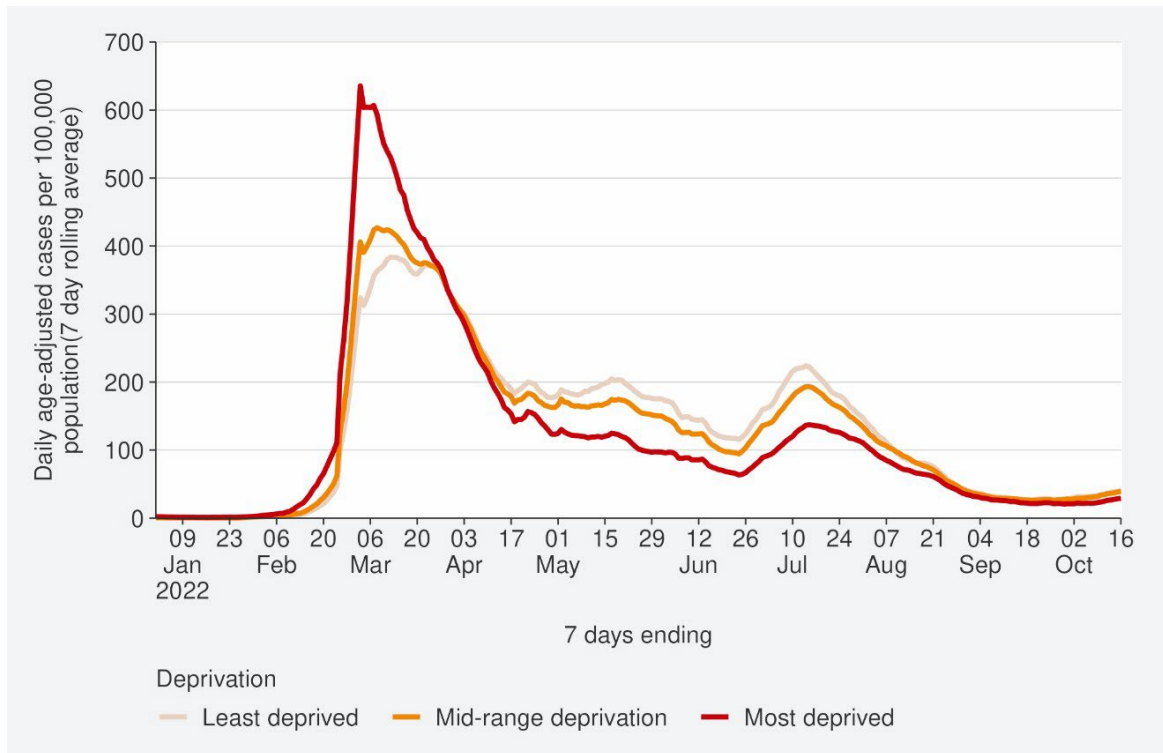
Source: NCTS/EpiSurv as at 2359hrs 16 October 2022

Figure 17: Age-standardised hospital admission rates for COVID-19 by deprivation from January to 16 October 2022
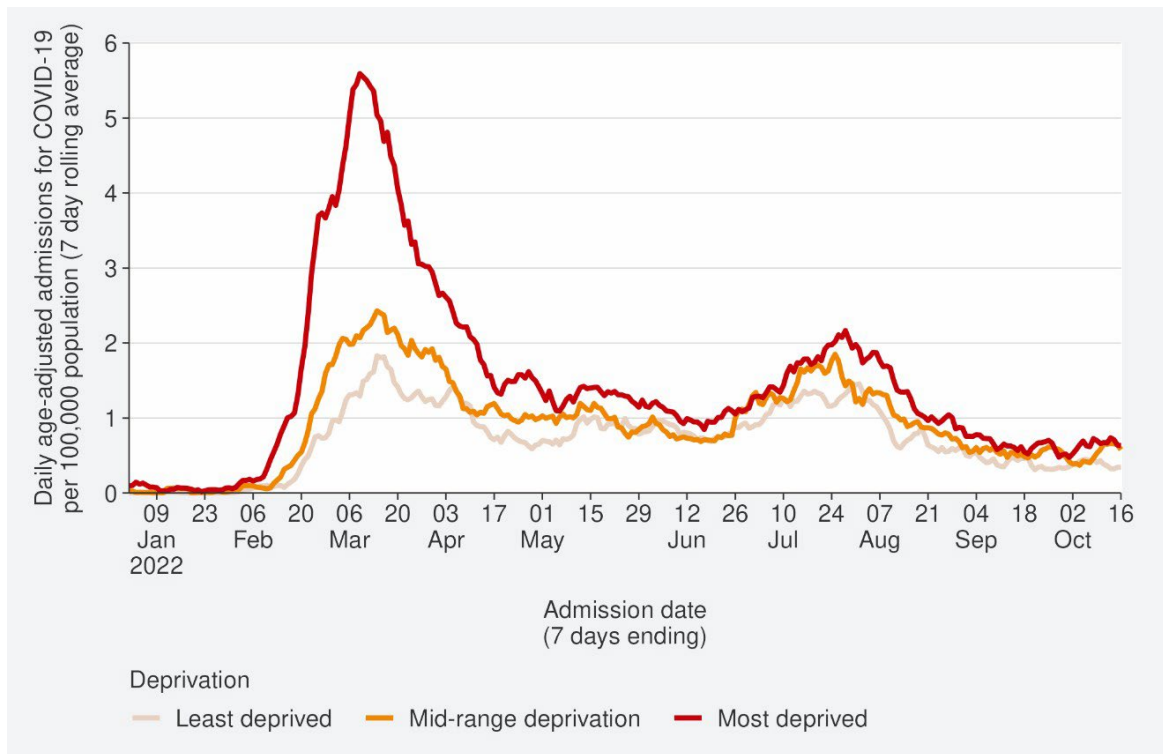
Source: NMDS/Inpatients admissions feed as of 18 October 2022 data up to 16 October 2022

Figure 18: Age-standardised cumulative incidence (and 95% confidence intervals) of hospitalisation for COVID-19 by deprivation, 01 January 2022 to 16 October 2022
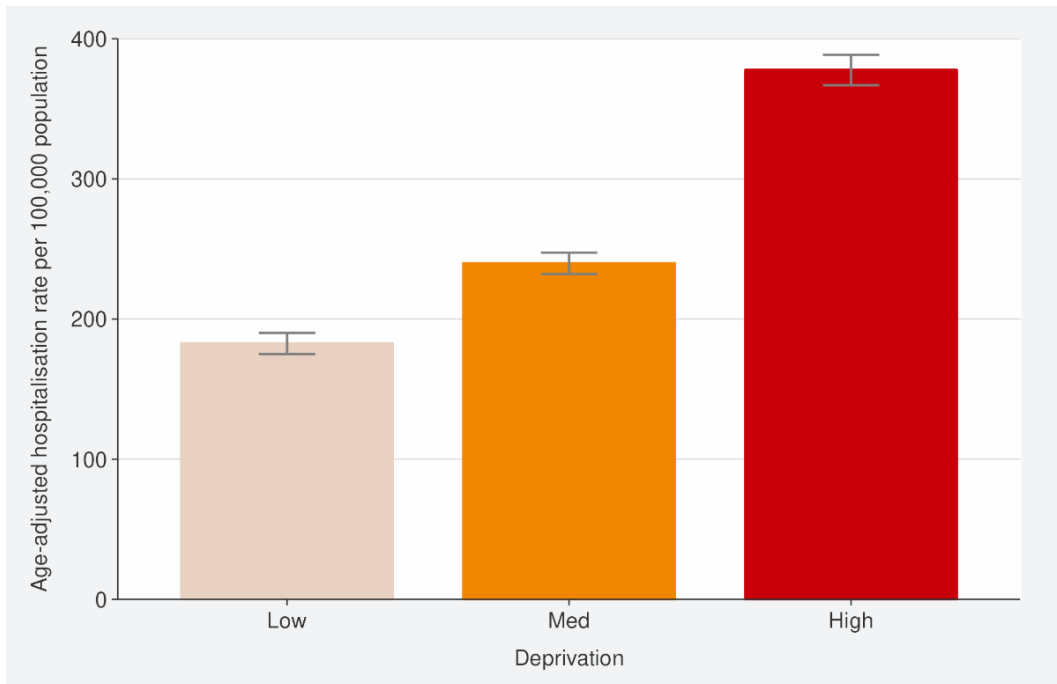
Source: NCTS/EpiSurv, NMDS, Inpatient Admissions dataset and CVIP population estimates 01 January 2022 to 16 October 2022

Figure 19: Age-standardised cumulative incidence (and 95% confidence intervals) of mortality attributed to COVID-19 by deprivation, 01 January 2022 to 02 October 2022
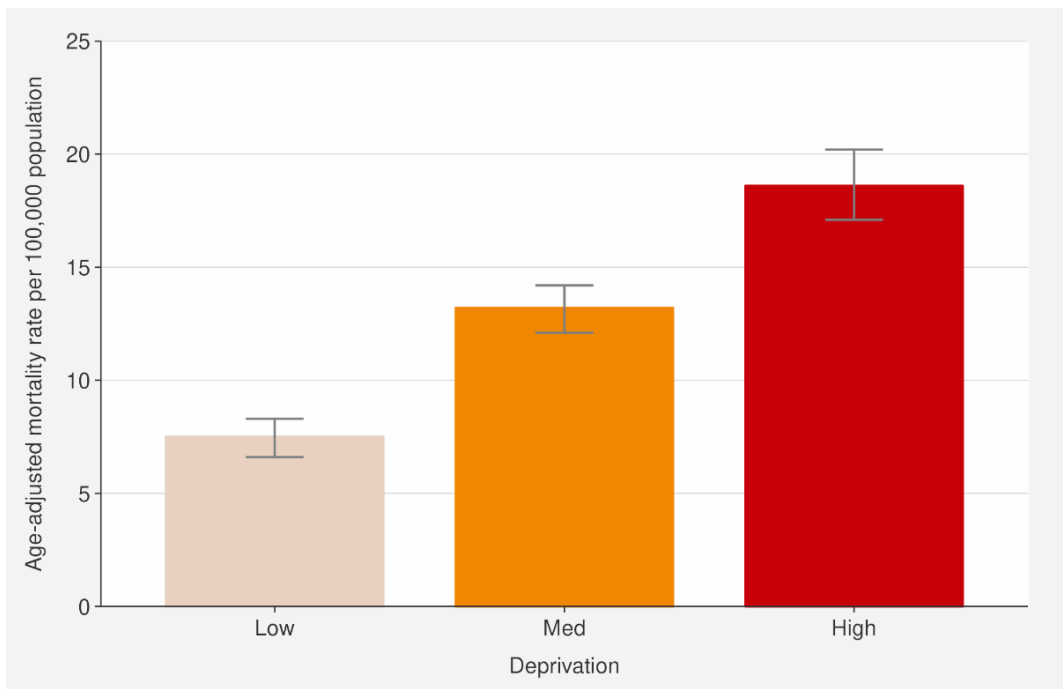
Source: EpiSurv, Death Documents, The Healthcare User database, Mortality Collections database and CVIP population estimates, 01 January 2020 to 02 October 2022

Global pandemic summary

We expect the global situation for the COVID-19 pandemic in the next few months to be driven by the ongoing emergence of new variants, waning immunity, and the Northern Hemisphere heading towards the winter season.

- Globally, in the week ending 16 October, the number of new weekly cases decreased by 6% as compared to the previous week, with over 2.9 million new cases reported.

- The number of new weekly deaths decreased by 17% compared to the previous week, with over 8,300 fatalities reported.

- Globally, as of 16 October 2022, over 612 million confirmed cases and over 6.5 million deaths have been reported.

- There continues to be increased diversity within Omicron and its descendent lineages. A number of these descendant lineages are under monitoring.

- BA.2 descendent lineages (including BA.2.75) still shows a relatively low (3.9% as of 02 October) prevalence globally.

- BA.5 Omicron descendent lineages continue to be dominant globally, with an increase in weekly prevalence from 76.2% to 78.9%.

- Decreases in countries' frequency of submitting COVID-19 genomes to GISAID make detecting accurate international representations of variant prevalence difficult.

- Omicron variant XBB is currently driving a wave in Singapore.

- In Australia, cases in NSW increased by 12% in the week ending 11 October. Cases in Victoria decreased by 12% in the week ending 11 October. The BQ.1.1 subvariants is accounting for approximately 5% of cases[14] in NSW in the week ending of 01 October.

Sources: **World Health Organisation: Weekly epidemiological update on COVID-19 – 19 October 2022 / Australian Government - Department of Health and Aged Care / New South Wales Government Respiratory Surveillance Report**

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.

[14] with caveat small sample size

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 09/10/2022 | | Week ending 16/10/2022 | | % Change | Week ending 02/10/2022 | | Week ending 09/10/2022 | | % 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	**1598.1**	**32.2**	**2041.0**	**41.1**	**27.7 %**	**28.0**	**0.8**	**26.1**	**0.7**	**-6.6%**
Region										
Northern	646.3	34.1	830.4	43.8	28.5%	12.4	0.7	15.3	0.8	23.0%
Te Manawa Taki	284.9	29.3	308.4	31.8	8.3%	3.1	0.7	3.7	0.9	18.2%
Central	312.4	33.3	469.4	50.1	50.3%	2.0	0.4	1.3	0.3	-35.7%
Te Waipounamu	352.7	30.8	430.7	37.6	22.1%	6.4	0.7	7.7	0.8	20.0%
Age group										
<5	48.3	15.3	61.7	19.6	27.8%	1.4	0.6	2.7	1.2	90.0%
5-14	81.0	12.0	98.1	14.6	21.2%	1.0	0.2	0.6	0.1	-42.9%
15-24	183.9	29.7	202.9	32.8	10.3%	0.9	0.2	1.6	0.3	83.3%
25-44	525.0	38.9	655.3	48.6	24.8%	3.9	0.4	3.4	0.3	-11.1%

45-64	481.1	38.6	623.4	50.0	29.6%	4.3	0.5	5.7	0.6	33.3%
65+	278.7	36.5	399.6	52.4	43.4%	12.6	2.3	14.0	2.6	11.4%
Ethnicity										
Māori	159.0	20.8	181.7	23.8	14.3%	2.4	0.5	3.1	0.7	29.4%
Pacific peoples	70.3	19.2	103.7	28.3	47.6%	1.0	0.3	2.9	0.9	185.7%
Asian	314.6	42.9	382	52.1	21.4%	4.0	0.6	5.3	0.8	32.1%
European or Other	1043.7	33.8	1358.7	44.1	30.2%	16.6	0.7	16.7	0.8	0.9%
Deprivation										
Least deprived	539.0	37.4	674.4	46.8	25.1%	7.3	0.6	7.6	0.7	3.9%
Mid-range deprivation	663.6	35.0	851.4	44.9	28.3%	9.0	0.6	10.0	0.7	11.1%
Most deprived	368.4	24.7	480.7	32.3	30.5%	6.9	0.6	9.9	0.9	43.8%

Table 2: Cumulative reported cases and hospitalisations admissions from January 2022 to 16 October by level 2 ethnicity.

Ethnicity	Level 2 Ethnicity	Cumulative reported cases of COVID-19	Cases per 1000 population	Cumulative hospitalization for COVID-19	Hospitalizations per 1000 population	Population
Asian	Asian NFD	8727	391	25	1	22320
Asian	Chinese	58381	248	464	2	235331
Asian	Indian	95220	389	794	3	245079
Asian	Other Asian	45842	377	305	3	121732
Asian	Southeast Asian	52907	486	241	2	108939
Māori	Māori	268434	352	3129	4	762780
MELAA[15]	African	9704	368	115	4	26364
MELAA	Latin American / Hispanic	13435	463	75	3	28998
MELAA	Middle Eastern	9615	297	158	5	32395
Pacific Peoples	Cook Island Māori	18929	355	285	5	53299
Pacific Peoples	Fijian	17118	418	188	5	40956
Pacific Peoples	Niuean	7715	396	119	6	19477
Pacific Peoples	Other Pacific Island	6853	474	70	5	14466
Pacific Peoples	Pacific Island NFD	1620	442	6	2	3663
Pacific Peoples	Samoan	66921	432	1037	7	154997
Pacific Peoples	Tokelauan	2782	405	44	6	6863
Pacific Peoples	Tongan	29472	405	498	7	72703

[15] MELAA refers to Middle Eastern, Latin American and African