



COVID-19 hospitalisation peaks in Australian States since Omicron emerged: potential relevance to Aotearoa NZ

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In this blog we examine the hospitalisation and ICU burden from the recent waves of COVID-19 in Australia, dominated by the Omicron variant.

The peak in hospitalisations in Australia during the months of December 2021 and January 2022 occurred on 19 January with 5,302 people in hospital. ICU numbers also peaked on the 19 January at 424 people. Applying the Australian experience to NZ on a per capita basis would suggest peaks of 1,107 people in NZ hospitals and 90 people in ICUs. We also discuss the value and limitations of using the Australian experience to inform planning for the developing NZ Omicron wave.

Australia is in the middle of a COVID-19 wave, predominantly fuelled by the new Omicron variant. Omicron was first [detected in Australia](#) on the 28 November 2021, just three days after it was first identified by [South African](#) scientists. By [early December 2021](#), [community cases](#) of the Omicron variant were already confirmed in Australia. Following the Delta variant waves in Australia beginning in July 2022, mainly experienced in New South Wales (NSW) and Victoria, the ongoing Omicron wave in Australia is substantially larger. Cases in Australia have increased exponentially with [~2.31 million confirmed](#) COVID-19 cases occurring in the last two months, substantially higher than the 215,046 total cases from January 2020 up to November 2021. Furthermore, Australia just experienced its [highest daily death toll](#) with 98 individuals dying from COVID-19 on 28 January 2022.

The large number of cases in Australia has resulted in a sharp increase in hospital and ICU admissions, which are [higher than](#) observed in NSW and Victoria during their peak Delta waves in September/October 2021. This surge has led to [extreme stress](#) on the [health system](#), although it appears that the Omicron wave may have now [peaked in NSW and Victoria](#). Many [other nations](#) have also experienced Omicron pandemic waves that have resulted in high case numbers (see appendix). As New Zealand (NZ) begins its own journey through community transmission of the Omicron variant on top of the [dwindling Delta cases](#), we cautiously apply the experience of Omicron in Australia in terms of people in hospital and ICU to a hypothetically equivalent NZ population.

COVID-19 hospital and ICU admissions

In this blog we have taken the reported number of COVID-19 cases in hospital and ICU for all Australian States/Territories, and then projected an equivalent estimate for NZ on a per capita level (Table). The time period is from 1 December 2021 to 31 January 2022 which we suggests captures the start of the Omicron wave in Australia, albeit with some Delta variant overlap, in particular for NSW and Victoria.

The data show that NSW has, up to January 2022, experienced a peak hospitalisation number at 2,863 and peak ICU at 217, both occurring on 19 January 2022. When applying this to a hypothetical per capita equivalent in NZ, we could expect to see peak hospitalisation reach 1,792 and 136 in ICU in NZ. However, peak hospitalisation per 100,000 in Australia is highest in the Northern Territory, reaching 49.1 per 100,000, which would equate to a per capita peak of 2,518 hospitalisations in NZ. Looking at Australia overall (and bearing in mind that hospitalisations and ICU numbers may not yet have peaked in all [States/Territories](#)) and equating this to NZ, there might be an equivalent peak of 1,107 in hospital and 90 in ICU in NZ.

Table: Australia's peak numbers in hospital and ICUs for COVID-19 from December 2021 to January 2022 with hypothetical NZ estimates based on per capita projections

| Australian data (as of 31 January 2022 and ordered by decreasing rate of peak hospitalisations) | | | | | Hypothetical per capita equivalent for NZ* based on Australian data | |
|---|------------------------------------|--------------------------------|---|---|---|---------------------|
| States/Territory** | Peak no. in hospital and peak date | Peak no. in ICUs and peak date | Peak no. in hospital per 100,000 population | Peak no. in ICUs per 100,000 population | NZ peak no. in hospital | NZ peak no. in ICUs |
| Northern Territory | 121 (30 Jan 2022) | 5 (29 Jan 2022) | 49.1 | 2.0 | 2,518 | 104 |
| New South Wales | 2,863 (19 Jan 2022) | 217 (19 Jan 2022) | 35.0 | 2.6 | 1,792 | 136 |
| Victoria | 1,229 (17 Jan 2022) | 129 (17 Jan 2022) | 18.5 | 1.9 | 948 | 99 |
| Queensland | 928 (25 Jan 2022) | 54 (21 Jan 2022) | 17.8 | 1.0 | 911 | 53 |
| Australian Capital Territory | 73 (27 Jan 2022) | 6 (18 Jan 2022) | 16.9 | 1.4 | 866 | 71 |
| South Australia | 298 (21 Jan 2022) | 37 (22 Jan 2022) | 16.8 | 2.1 | 862 | 107 |
| Tasmania | 41 (24 Jan 2022) | 3 (20 Jan 2022) | 7.6 | 0.6 | 388 | 28 |
| Western Australia | 3 (28 Jan 2022) | 1 (25 Jan 2022) | 0.1 | 0.04 | 6 | 2 |
| Australia total | 5,302 (19 Jan 2022) | 424 (19 Jan 2022) | 20.6 | 1.6 | 1,107 | 90 |

*NZ population estimate from [Statistics New Zealand](#).

**Australian COVID-19 hospitalisations and ICU data from <http://www.covid19data.com.au> and latest Australian population estimates from the [Australian Bureau of Statistics](#).

What is the relevance of Australia's Omicron experience to NZ?

While we can draw a lot from the Australian experience of Omicron in the community in terms of its impact on the health system, we must be cautious as the COVID-19 experience may vary given differences for example in the ratio of the Delta/Omicron variants, population demographics, use of public health measures, vaccination levels (and timing), and health system capacity. Nevertheless, we would probably put more weight on the relevance of the Australian experience for predicting the upcoming NZ experience, than the estimates in [recent IHME modelling in NZ](#) that are substantially higher (eg, peaking at 2,395 people in hospital and 458 in ICU in the 21 January [update](#) of this modelling). ICU capacity is an ongoing concern, with the estimates for NZ based on Australia's experience suggesting a peak ICU demand of 90, although this rises to 136 if we use the NSW based figures for NZ. Although both these estimates are substantially lower than the updated IHME ICU predictions (see above), this number still raises questions about NZ's ICU capacity given a [recent report](#) suggesting that given current ICU use, there remains only 108 ICU beds available nationally.

Looking at COVID-19 vaccination levels between the two countries:

- At the peak of the Omicron wave in terms of hospitalisations and ICU demand in Australia on [19 January 2022](#), 76% of [Australia's total population](#) had had one COVID-19 vaccine dose, 74% had had two doses, and 22% had a booster dose.
- Currently as of [2 February 2022](#), 83% of [NZ's total population](#) have had at least one

vaccine dose, 77% a second dose, and 27% a booster dose.

- These differences in vaccination levels mean that NZ is ahead of Australia in primary vaccination coverage (ie, first and second doses) and booster coverage at the start of our expected Omicron wave. However, issues of equity with the vaccination roll-out are observed in NZ as vaccination rates for Māori and Pasifika are lower than European/Other and Asian populations, which may leave some ethnic groups at greater risk for poorer outcomes in the upcoming COVID-19 wave.

The [NZ Ministry of Health](#) announced on 31 January 2022 that as the ‘Omicron variant of Covid-19 is now the dominant variant, therefore the specific variant of the virus is no longer being reported alongside case numbers’. This means that the full impact of having dual Omicron and Delta epidemics in NZ may not be discernible (unless perhaps a sampling method for further genomics work is done eg, on hospitalised cases). However, what we have observed in Australia is that in the States/Territories that had both Omicron and Delta circulating widely in the community, such as NSW and Victoria, the outcomes were largely poorer in terms of hospitalisation and mortality. There is a variety of factors involved with these outcomes including less vaccine effectiveness for the Omicron variant, however Omicron is generally being [less severe](#) than Delta. Furthermore, the use of public health measures varied between States/territories in Australia. For example, [South Australia](#) and [Victoria](#) kept more substantial public health measures in place during their respective Omicron waves compared to [NSW](#), who later had to re-impose measures such as mask-wearing and social distancing requirements due to the overwhelming size of its Omicron wave.

What can NZ still do to reduce the burden on the healthcare system?

We are left asking the question, what can NZ do at this point in the pandemic, with a widespread Omicron outbreak looming? We suggest the following actions by the Government to aid the management of COVID-19 in NZ and to help ‘flatten the curve’ in order to reduce the impact on the health system from Omicron:

- Consider preparing for a worst-case scenario of over 1,500 cases per day in hospital (although the “most likely” peak would probably be lower than this given the Australian experience).
- Continue increasing ICU capacity both in terms of beds available and the necessary trained staff.
- Continue targeted measures to raise [vaccine coverage](#) for disadvantaged and at-risk populations, and consider providing third (booster) dose access to 12-17 year olds and reducing the interval between first and second dose for 5-11 year olds. The [reduction of time](#) between the second and booster dose to 3 months for adults is a recent valuable move by the Government.
- Continue encouraging widespread use of masks for the general public, ideally high-quality respirator style masks (N95 masks or equivalent). There should be a particular focus on the elderly and those at increased-risk (and their immediate family members and caregivers).
- Provide both high quality masks and Rapid Antigen Tests to specific sectors of the workforce, such as all hospital, primary care and aged-care residential workers, education staff, and essential service workers.
- Plan for provision of services for the elderly and those at increased risk, such as providing food/medicine supplies at-home for those who are restricting their potential exposure to COVID-19 over the next few weeks/months.
- Work on addressing [poor ventilation](#) in all NZ schools, universities and early childhood

centres. This measure could also be extended to all health care and essential service settings.

- Consider other [previously suggested](#) measures such as an upgraded Alert Level system (in particular one that can be adapted as required during a COVID-19 wave), a national mask strategy, a testing strategy (including wider access to RATs and information about how to use them effectively), and greater provision of home care support.

In summary, the next few weeks and months will likely see a widespread Omicron outbreak in NZ. If NZ follows a similar path to Australia, we can expect to see high hospitalisation numbers along with ICU numbers reaching or exceeding capacity. However, if more extensive public health measures are promoted by the NZ Government and adopted by New Zealanders, the impact on public health and the health care system can be reduced.

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Appendix 1: Comparison of COVID-19 pandemic metrics in NZ and a selection of other countries, January 2022

Appendix Table: Covid-19 cases and deaths, 7-day average at 1 February 2022 in selected countries from [Our World in Data](#)

| Country | Cases per day | Cases per million population | Deaths per day | Deaths per million population | Case fatality risk |
|-----------|---------------|------------------------------|----------------|-------------------------------|--------------------|
| US | 430,989 | 1,294 | 2,530 | 7.6 | 0.35% |
| UK | 76,427 | 1,120 | 360 | 5.3 | 0.39% |
| Sweden | 37,274 | 3,668 | 38 | 3.8 | 0.12% |
| Australia | 40,069 | 1,553 | 87 | 3.4 | 0.13% |
| NZ | 153 | 30 | <1 | 0.03 | 0.21% |

All of these countries, except for NZ (where it is just starting), have experienced Omicron variant pandemic waves that are resulting in very high case numbers and rates.

The case fatality risk is relatively low, but the high case numbers result in considerable deaths and relatively high mortality rates, eg, Australia is having its highest daily mortality rate since the pandemic began.

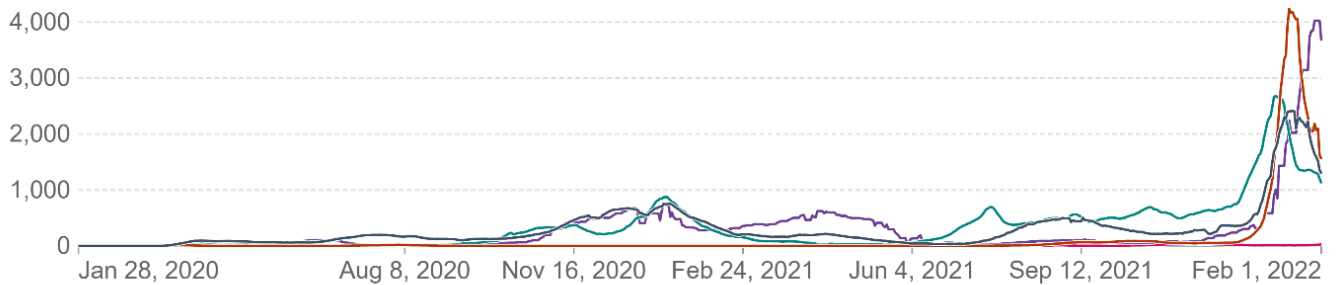
Daily new confirmed COVID-19 cases & deaths per million people



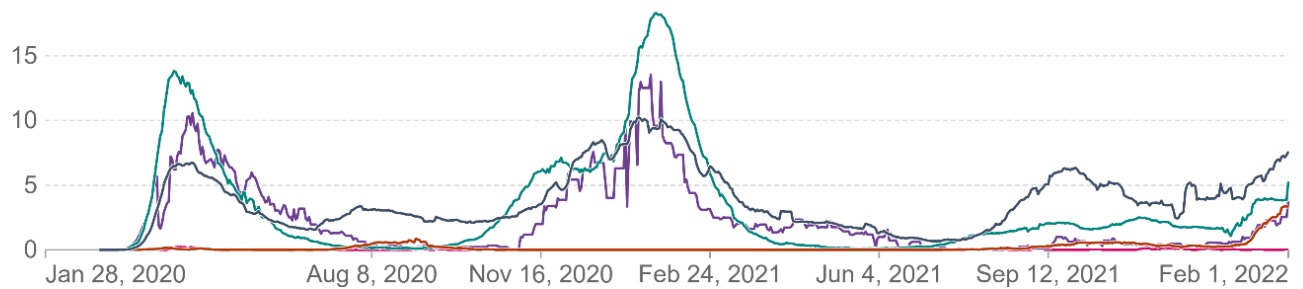
7-day rolling average. Limited testing and challenges in the attribution of cause of death means the cases and deaths counts may not be accurate.

United States Australia United Kingdom Sweden New Zealand

New cases (per 1M)



New deaths (per 1M)



Source: Johns Hopkins University CSSE COVID-19 Data

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