# COVID-19 Monitor
COVID-19 cases, testing, variants, vaccines, hospitalisations and deaths

07 October 2021

## Table 1: NSW key indicators as at 05 October 2021*

<table>
<thead>
<tr>
<th>Key indicators</th>
<th>Date: 02 Oct (previous week: 25 Sep)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average daily COVID-19 locally acquired cases, week to 02 Oct</td>
<td>839</td>
</tr>
<tr>
<td>Compared to previous week</td>
<td>1,013 (-174)</td>
</tr>
<tr>
<td>Growth factor for locally acquired cases</td>
<td>0.97</td>
</tr>
<tr>
<td>Doubling time (days)</td>
<td>NA</td>
</tr>
<tr>
<td>Average daily COVID-19 deaths, week to 02 Oct</td>
<td>10</td>
</tr>
<tr>
<td>Compared to previous week</td>
<td>8 (+2)</td>
</tr>
<tr>
<td>COVID-19 patients under the care of NSW Health, as at 02 Oct</td>
<td>10,525</td>
</tr>
<tr>
<td>Compared to previous week</td>
<td>13,049 (-2,524)</td>
</tr>
<tr>
<td>COVID-19 patients in hospital, as at 02 Oct</td>
<td>975</td>
</tr>
<tr>
<td>Compared to previous week</td>
<td>1,141 (-166)</td>
</tr>
<tr>
<td>Percentage of patients unvaccinated</td>
<td>64.5%</td>
</tr>
<tr>
<td>Percentage of patients fully vaccinated</td>
<td>12.3%</td>
</tr>
<tr>
<td>COVID-19 patients in intensive care units (ICU), as at 02 Oct</td>
<td>194</td>
</tr>
<tr>
<td>Compared to previous week</td>
<td>221 (-27)</td>
</tr>
<tr>
<td>Percentage of patients unvaccinated</td>
<td>71.6%</td>
</tr>
<tr>
<td>Percentage of patients fully vaccinated</td>
<td>7.2%</td>
</tr>
<tr>
<td>Percentage of total ICU beds</td>
<td>35.2%</td>
</tr>
<tr>
<td>Compared to previous week</td>
<td>40.1% (-4.9%)</td>
</tr>
<tr>
<td>Rates per million</td>
<td></td>
</tr>
<tr>
<td>Average daily COVID-19 locally acquired cases (per million), week to 02 Oct</td>
<td>99.7 (-21)</td>
</tr>
<tr>
<td>COVID-19 under the care of NSW Health (per million), as at 02 Oct</td>
<td>1250.7</td>
</tr>
<tr>
<td>COVID-19 patients in hospital (per million), as at 02 Oct</td>
<td>115.9</td>
</tr>
<tr>
<td>COVID-19 patients in ICU (per million), as at 02 Oct</td>
<td>23.1</td>
</tr>
<tr>
<td>COVID-19 vaccination, as at 02 Oct</td>
<td></td>
</tr>
<tr>
<td>Number of persons aged 16+ given 1+ dose</td>
<td>5,812,301</td>
</tr>
<tr>
<td>Percentage of persons aged 16+ given 1+ dose</td>
<td>87.7%</td>
</tr>
<tr>
<td>Compared to previous week</td>
<td>+2.5%</td>
</tr>
<tr>
<td>(Average increase, the past four weeks)</td>
<td>(+3.4%)</td>
</tr>
<tr>
<td>Number of persons aged 16+ fully vaccinated</td>
<td>4,413,848</td>
</tr>
<tr>
<td>Percentage of persons aged 16+ fully vaccinated</td>
<td>66.6%</td>
</tr>
<tr>
<td>Compared to previous week</td>
<td>+6.5%</td>
</tr>
<tr>
<td>(Average increase, the past four weeks)</td>
<td>(+6.3%)</td>
</tr>
</tbody>
</table>

*Please see notes and sources at the end of this document.
COVID-19 Critical Intelligence Unit: COVID-19 cases, testing, variants, vaccines, hospitalisations and deaths

Background

Jurisdictions globally are facing different situations when it comes to COVID-19 cases, distribution of new variants, patient outcomes, vaccine rollout and testing. Understanding how these variables interplay as the pandemic progresses can provide insights for NSW.

Evidence

- Initially, in countries with high vaccination rates, such as the United States, Israel and Canada, low rates of new infections were being reported in vaccinated people.\(^1\)\(^-\)\(^3\)
- However, there are reports of sharp rises in case numbers in countries such as Israel following Delta’s arrival, despite more than 60% of the population being fully vaccinated.\(^4\)
- As case numbers rise, alternative testing approaches to the gold standard polymerase chain reaction (PCR) testing may be considered.\(^5\) These approaches include at-home testing, frequent rapid antigen tests (RAT), age-group-target testing, using samples of individuals from different households, or electronic screening using self-reported data.\(^5\)\(^-\)\(^1^1\)
- RAT have value as a screening step before PCR testing to confirm diagnosis, in particular with outbreaks where there is high local disease prevalence (such as currently in Sydney).\(^8, 1^2, 1^3\)
- The Therapeutic Goods Administration (TGA) will allow applications for regulatory approval to supply RAT for use at home in Australia after 1 November 2021.\(^1^4\)
- Viruses constantly change through mutation and new variants are expected over time. For SARS-CoV-2, there are four variants of concern as determined by the World Health Organization:
  - Alpha (B.1.1.7), originated in the United Kingdom and currently reported in 195 countries.
  - Beta (B.1.351), originated in South Africa and currently reported in 145 countries.
  - Gamma (B.1.1.28.1 or P.1), originated in Brazil and currently reported in 99 countries.
  - Delta (B.1.617.2), originated in India and currently reported in 192 countries.\(^1^5\)\(^-\)\(^1^7\)
- COVID-19 vaccines are effective at preventing severe disease. Real-world effectiveness data on hospitalisations and mortality following vaccination (namely Pfizer, AstraZeneca, Moderna and Sinovac) show vaccines are 71% to 98% effective at preventing COVID-19-related hospitalisation and 88% to 97% effective at preventing COVID-19-related death.\(^1^8\)\(^-\)\(^2^1\)
- Generally, vaccines are effective at neutralising Alpha, while there is reduced neutralisation for Gamma, Beta and Delta. All variants elicit cross-reactive neutralising antibodies.\(^1^6, 2^2\)\(^-\)\(^2^5\)
Table 2: Summary of public health, healthcare and vaccination measures (select countries and NSW) as at 05 October 2021*

<table>
<thead>
<tr>
<th></th>
<th>NSW</th>
<th>Australia</th>
<th>United Kingdom</th>
<th>United States</th>
<th>Canada</th>
<th>Israel</th>
<th>Denmark</th>
<th>Portugal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average daily confirmed cases†</td>
<td>839</td>
<td>2,127</td>
<td>33,482</td>
<td>105,054</td>
<td>4,058</td>
<td>3,324</td>
<td>451</td>
<td>590</td>
</tr>
<tr>
<td>Average daily confirmed cases (per million)</td>
<td>99.7</td>
<td>82.5</td>
<td>490.9</td>
<td>315.6</td>
<td>106.6</td>
<td>378.2</td>
<td>77.6</td>
<td>58.1</td>
</tr>
<tr>
<td>Fully vaccinated (%)‡</td>
<td>52.5%</td>
<td>46.0%</td>
<td>66.0%</td>
<td>55.2%</td>
<td>71.4%</td>
<td>64.4%</td>
<td>75.3%</td>
<td>85.2%</td>
</tr>
<tr>
<td>COVID-19 patients in hospital§</td>
<td>975</td>
<td>1,496</td>
<td>6,556</td>
<td>63,867</td>
<td>2,343</td>
<td>751</td>
<td>85</td>
<td>415</td>
</tr>
<tr>
<td>COVID-19 patients in hospital (per million)§</td>
<td>115.9</td>
<td>58.0</td>
<td>96.1</td>
<td>191.8</td>
<td>61.5</td>
<td>85.4</td>
<td>14.6</td>
<td>40.8</td>
</tr>
<tr>
<td>COVID-19 patients in ICU§</td>
<td>194</td>
<td>296</td>
<td>805</td>
<td>18,621</td>
<td>764</td>
<td>237</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>COVID-19 patients in ICU (per million)§</td>
<td>23.1</td>
<td>11.5</td>
<td>11.8</td>
<td>55.9</td>
<td>20.1</td>
<td>27.0</td>
<td>2.9</td>
<td>8.2</td>
</tr>
</tbody>
</table>

Notes
* For the selected countries, data is presented for 04 October 2021, accessed on 05 October 2021. For some measures, data were not available for 04 October, in which case the latest available data is shown. For NSW, data is presented for 02 October, accessed on 05 October 2021.
† Average daily confirmed cases and average daily vaccine doses are based on a seven-day average.
‡ Proportions for population covered are based on the full population
§ Patients in hospital include both cases on the ward and in ICUs. ICU data for NSW does not include cases in ICUs within paediatric hospitals.

Sources
- New cases for selected countries sourced on 05 October 2021 from Our World in Data. New cases for NSW sourced from NSW Health via the Notifiable Conditions Information Management System.
- Vaccination data for selected countries sourced on 05 October 2021 from Our World in Data. Vaccination data for NSW sourced from NSW Health via the Australian Government Department of Health Australian Immunisation Register.
- Data on the number of COVID-19 patients in hospital and ICUs were sourced on 05 October 2021 from:
  - for all countries (aside from Australia): Our World in Data
  - for Australia: COVID LIVE, which verifies data against Australian state and territory government health departments
  - for NSW: NSW Health via the Patient Flow Portal, taken from a 7pm snapshot, 02 October 2021.
COVID-19 testing rates

Figure 1 shows the daily rate per thousand population (rolling seven-day average) of COVID-19 tests in NSW, Australia, United Kingdom, United States, Canada, Israel, Portugal, Denmark and India, from April to October 2021.

Figure 1: Daily rates of COVID-19 tests (select countries and NSW), April – October 2021

Note: When comparing testing data across different countries, differences in ways of reporting may affect interpretation of data.
Source: Data for the selected countries sourced from Our World in Data. Data for NSW sourced from NSW Health via the Notifiable Conditions Information Management System. Both accessed 5 October 2021.
COVID-19 confirmed cases

Figure 2 shows the daily rate per million population (rolling seven-day average) of confirmed COVID-19 cases in NSW, Australia, United Kingdom, United States, Canada, Israel, Portugal, Denmark and India, from April to October 2021. Data is presented on a log (base 10) scale.

Figure 2: Daily rates of COVID-19 cases (select countries and NSW), April – October 2021

Note: Limited testing and delayed reporting likely result in underestimation of the actual number of confirmed cases.
Source: Data for the selected countries sourced from Our World in Data. Data for NSW sourced from NSW Health via Notifiable Conditions Information Management System. Both accessed 5 October 2021.

In brief documents are not an exhaustive list of publications but aim to provide an overview of what is already known about a specific topic. This brief has not been peer-reviewed and should not be a substitute for individual clinical judgement, nor is it an endorsed position of NSW Health.
COVID-19 vaccination rates

Figure 3 shows the daily (rolling seven-day average) vaccination rate per hundred population in NSW, Australia, United Kingdom, United States, Canada, Israel, Portugal, Denmark and India, from April to October 2021.

Figure 3: Daily vaccination rates (select countries and NSW), April – October 2021

Note: Vaccination rates for NSW are shown for the eligible (ages 16+) population.

Source: Data for the selected countries sourced from Our World in Data. Data for NSW is sourced from NSW Health via the Australian Government Department of Health Australian Immunisation Register. Both accessed 5 October 2021.
COVID-19 mortality rates

Figure 4 shows the daily (rolling seven-day average) mortality rate per million population in NSW, Australia, United Kingdom, United States, Canada, Israel, Portugal, Denmark and India, from April to October 2021.

Figure 4: Daily mortality rates (select countries and NSW), April – October 2021

Note: Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.

Source: Data for the selected countries sourced from Our World in Data. Data for NSW sourced from NSW Health via the Notifiable Conditions Information Management System. Both accessed 5 October 2021.
COVID-19 Critical Intelligence Unit: COVID-19 cases, testing, variants, vaccines, hospitalisations and deaths

COVID-19 cases, testing, variants, vaccines, hospitalisations and deaths

The following graphs (figures 5-10) show COVID-19 cases and vaccination rates; hospitalisation and death rates; and the variant distribution for NSW, Australia, United Kingdom, United States, Canada and Israel.

Series a: COVID-19 cases and vaccinations

The graphs in series ‘a’ show COVID-19 cases and vaccination rates specific to NSW and each of these countries, from April to October 2021. They include:

- the daily number of confirmed COVID-19 cases
- the cumulative number of people who have received at least one vaccine dose (per 100 population)
- the cumulative number of people fully vaccinated (per 100 population).

For NSW, vaccination rates are shown for the eligible (ages 16+) population.

These graphs should be interpreted with caution as there are other factors that may influence the number of cases in addition to vaccination rates, including the level of social restrictions.

The number of people fully vaccinated in Australia is only available from late May 2021 onwards.

Note, there is variation in ‘x’ axis scales and some gaps in time series across these graphs due to missing data.

Series b: COVID-19 hospitalisation and death rates

The graphs in series ‘b’ show COVID-19 hospitalisation and death rates for NSW and each of these countries. Specifically, they show the daily number of hospitalised patients (per million population) and the daily number of new deaths (rolling seven-day average and per million population), from April to October 2021.

Series c: COVID-19 variant distribution

The graphs in series ‘c’ show the COVID-19 variant distribution for each of these countries. Specifically, they show COVID-19 variant distribution for cases sequenced, and the percentage of total COVID-19 cases sequenced, from April to October 2021.

For most countries, weekly counts are shown; however, only monthly counts were available for Canada. No variant information is available for NSW.

Note, there is variation in ‘x’ axis scales.
NSW

Figure 5a: COVID-19 cases and vaccinations, NSW, April – October 2021

Figure 5b: COVID-19 hospitalisation and mortality rates, NSW, April – October 2021
COVID-19 Critical Intelligence Unit: COVID-19 cases, testing, variants, vaccines, hospitalisations and deaths

Australia

Figure 6a: COVID-19 cases and vaccinations, Australia, April – October 2021

Figure 6b: COVID-19 hospitalisation and mortality rates, Australia, April – October 2021

Figure 6c: COVID-19 variant distribution for sample of cases that have been sequenced, Australia, April – October 2021
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United Kingdom

Figure 7a: COVID-19 cases and vaccinations, United Kingdom, April – October 2021

Figure 7b: COVID-19 hospitalisation and mortality rates, United Kingdom, April – October 2021

Figure 7c: COVID-19 variant distribution for sample of cases that have been sequenced, United Kingdom, April – October 2021
United States

Figure 8a: COVID-19 cases and vaccinations, United States, April – October 2021

Figure 8b: COVID-19 hospitalisation and mortality rates, United States, April – October 2021

Figure 8c: COVID-19 variant distribution for a sample of cases that have been sequenced, United States, April – October 2021
Canada

Figure 9a: COVID-19 cases and vaccinations, Canada, April – October 2021

Figure 9b: COVID-19 hospitalisation and mortality rates, Canada, April – October 2021

Figure 9c: COVID-19 variant distribution for a sample of cases that have been sequenced, Canada, April – October 2021

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Israel

Figure 10a: COVID-19 cases and vaccinations, Israel, April – October 2021

Figure 10b: COVID-19 hospitalisation and mortality rates, Israel, April – October 2021

Figure 10c: COVID-19 variant distribution for a sample of cases that have been sequenced, Israel, April – October 2021
NSW key indicators

Notes

- Data is presented for all indicators as at 2 October 2021 (previous week, 25 September 2021), data accessed on 5 October 2021.
- Average daily locally acquired cases and average daily deaths are based on the seven days to 2 October (previous week, seven days to 25 September).
- For any given day, the growth factor for locally acquired cases is a ratio of cases notified in the seven days ending that day, to the cases notified in the seven days ending yesterday.
- The doubling time is the time required in days until the current number of locally acquired cases doubles, based on the growth factor.
- COVID-19 patients under the care of NSW Health include patients on the ward, ICUs, hospital in the home, out of hospital care and community clinics. Patients in hospital include cases on the ward and in ICUs. ICU data for NSW does not include cases in ICUs within paediatric hospitals.
- Estimated per million population rates calculated using population estimates at 30 June 2021 based on the Australian Bureau of Statistics estimated resident population and population projections based on data from the NSW Department of Planning, Industry and Environment. Elsewhere in this document, 2019 population figures are used in line with international data available.
- Figures for the 16+ population used to calculate rates for vaccination are drawn from NSW Health via the Australian Government Department of Health Australian Immunisation Register.
- The rate of hospitalisation/ICU admission (per million) among the unvaccinated population is calculated as the number of unvaccinated COVID-19 cases in hospital against the total number of the unvaccinated population. The rate of hospitalisation/ICU admission (per million) among the vaccinated population is calculated as the number of COVID-19 cases in hospital who have received at least two doses of vaccination, against the total number of the fully vaccinated population.
- The risk ratio for hospitalisation/ICU admission (unvaccinated against vaccinated population) is interpreted as the increased risk of hospitalisation/ICU admission for people who are unvaccinated compared to those who are fully vaccinated against COVID-19.

Sources

- New cases for NSW sourced from NSW Health via Notifiable Conditions Information Management System.
- Vaccination data sourced from NSW Health via the Australian Government Department of Health Australian Immunisation Register.
- Hospital capacity, admissions and proportion of vaccinated cases data is sourced from NSW Health via the Patient Flow Portal and is taken from a 7pm snapshot, 4 October 2021.

COVID-19 cases, testing, variants, vaccines, hospitalisations and deaths

Notes

- With regards to the figures on COVID-19 variants, all SARS-CoV-2 sequences were downloaded from the GISAID EpiCOV™ Database. PANGO lineage (variant) classification for each individual sequence was provided by GISAID.
COVID-19 Critical Intelligence Unit: COVID-19 cases, testing, variants, vaccines, hospitalisations and deaths

- Dates displayed are based on the sample collection date. Sequences with collection dates specifying the year only were excluded, while collection dates specifying the year and month were assigned to the 15th of that month.

- Sequences with lengths ≤20,000 base pairs were removed from the analysis; as were non-human hosts.

- Only a non-random sample of cases are sequenced. For many countries, the proportion of cases sequenced is very low. As a result, this report does not indicate the true prevalence of the variants but rather a best estimate currently available.

- All data used to generate these graphs is subject to the GISAID terms and conditions.33

Sources

- Data on variants enabled by GISAID. Accessed 5 October 2021.32

- Data on total number of cases and vaccinations for the selected countries are sourced from Our World in Data; accessed 5 October 2021.26

- Data on total number of cases for NSW are sourced from NSW Health via the Notifiable Conditions Information Management System.27 Data on vaccinations for NSW is sourced from NSW Health via the Australian Government Department of Health Australian Immunisation Register.28 All accessed 5 October 2021.

- Data on the number of hospitalisations and new deaths for the United Kingdom, the United States, Canada and Israel were sourced from Our World in Data.26, 29 Data on the number of hospitalisations and new deaths for Australia were sourced from COVID LIVE, which verifies data against Australian state and territory government health departments.29 Data on the number of hospitalisations for NSW are sourced from NSW Health via the Patient Flow Portal.30 Data on the number of deaths for NSW are sourced from NSW Health via the Notifiable Conditions Information Management System.27 All accessed 5 October 2021.

Method

The NSW Health Critical Intelligence Unit maintains living evidence tables on COVID-19 vaccines and SARS-CoV-2 variants.17, 34 To inform this brief, a review of the evidence included in the living tables was undertaken on 27 April 2021 and these are reviewed each week for new relevant information.

Countries were chosen based on contemporary relevance with regards to the variables of interest in the NSW and Australian context (cases, tests, variants, vaccines and patient outcomes).
COVID-19 Critical Intelligence Unit: COVID-19 cases, testing, variants, vaccines, hospitalisations and deaths

References

surveillance data. The Lancet. 2021;397(10287):1819-29. DOI: 10.1016/S0140-6736(21)00947-8