

COVID-19 WEEKLY SURVEILLANCE IN NSW

EPIDEMIOLOGICAL WEEK 23, ENDING 6 JUNE 2020

Published 10 June 2020

SUMMARY FOR THE WEEK ENDING 6 JUNE

- There were 16 COVID-19 cases reported in the week ending 6 June 2020 – largely in people who had travelled overseas.
- NSW has gone without a confirmed case of community transmission of Coronavirus during the last two weeks.
- Testing rates were higher this week across most local health districts and again increased significantly this week in school-aged children
- Community restrictions and physical distancing measures in place to control the spread of COVID-19 have had a positive impact on the transmission of other respiratory illnesses:
 - The percent positive rate for influenza continues at very low rates.
 - Presentations for pneumonia to NSW emergency departments have decreased below the usual range for this time of year.
 - There is a decrease in reported typical flu-like symptoms for this time of year.
- Continued high rates of testing are necessary to detect and reduce the spread of COVID-19 in the community.
- NSW Health urges people of all ages, including children, to undergo COVID-19 testing and isolate themselves as soon as mild symptoms of respiratory infection or fever appear.

In Focus – COVID-19 hospitalisations in NSW: 1 January to 19 April 2020

A linkage of NSW hospital admission data to notifications of people with COVID-19 was undertaken to examine patterns of serious disease.

- Of 2,988 people with COVID-19 diagnosed from 1 January to 19 April 2020, 12% were hospitalised, 4% were admitted to an Intensive Care Unit (ICU) and 1.4% received respiratory support.
- The likelihood of hospitalisation, ICU admission and respiratory support differed by age. People aged 80-89 years were the most likely to be hospitalised (46.5%), whilst those aged 70-79 years were the most likely to be admitted to ICU (10.4%) and to receive respiratory support (4.4%). No people aged less than 30 years required respiratory support.
- Close to half (47%) of all people admitted to hospital with COVID-19 had a hospital diagnosis of pneumonia or lower respiratory tract infection.
- The median time from onset of illness to first hospitalisation was 7 days. This indicates it may take about a week for people with serious illness from COVID-19 to deteriorate and to need to be hospitalised.
- Men were more likely to be hospitalised and admitted to the ICU than women. This difference was particularly obvious in those aged over 70 years.

SECTION 1: HOW IS THE OUTBREAK TRACKING IN NSW?

Confirmed COVID-19 cases (people infected with the SARS-CoV-2 virus) includes NSW residents diagnosed in NSW who were infected overseas and in Australia (in NSW and interstate) and interstate or international visitors diagnosed in NSW who are under the care of NSW Health.

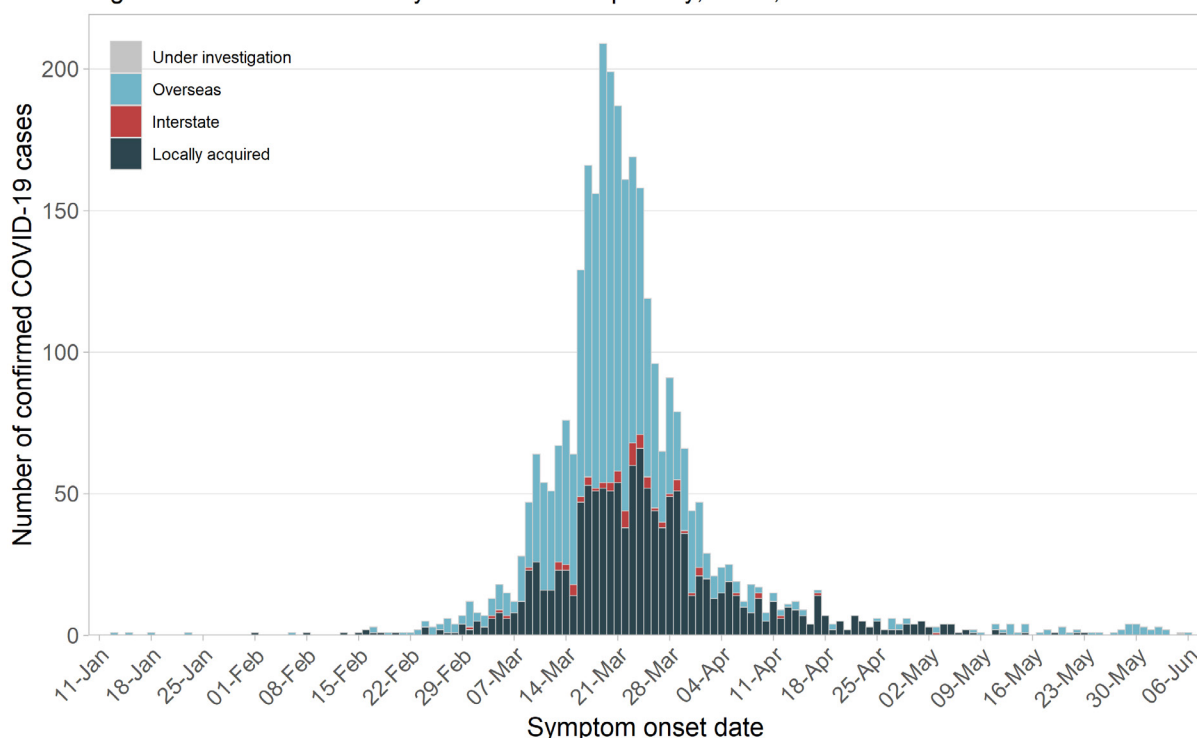
Table 1. COVID-19 cases and tests reported in NSW, up to 6 June 2020

	Week ending 6 June	Week ending 30 May	% change	Total to 6 June
Number of cases	16	12	+33%	3,110
<i>Overseas acquired</i>	15	9	+67%	1,794
<i>Interstate acquired</i>	0	0	-	70
<i>Locally acquired</i>	0	3	-100%	1,245
<i>Under investigation</i>	1	0	-	1
Number of deaths	0	0	-	50
Number of tests	61,993	58,352	+6.2%	574,867

Note: The case numbers reported for previous weeks is based on the most up to date information from public health investigations.

To understand how the outbreak is tracking we look at how many new cases are reported each day and the number of people being tested. Each bar in the graph below represents the number of new cases based on the date the case started to feel unwell (known as the date of symptom onset). This information is collected by public health staff on interview with the case at the time of diagnosis.

Figure 1. COVID-19 cases by onset of illness per day, NSW, 2020



Note: For asymptomatic cases or where symptom onset date is not available, the onset date is calculated from the earliest specimen collection date.

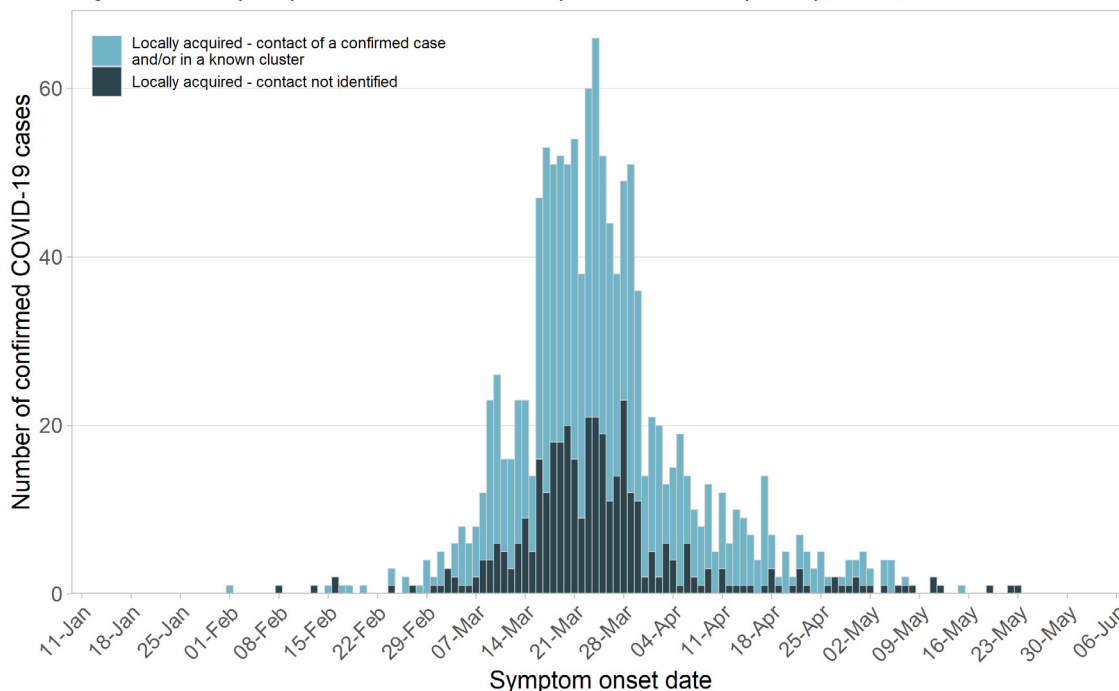
Interpretation: Approximately 60% of COVID-19 infections diagnosed in NSW to 6 June were acquired outside of NSW (almost all overseas) and the remaining 40% have been acquired locally (in NSW). The number of new cases reported in NSW has decreased significantly since the peak in mid-March. The number of cases with an overseas source in recent weeks is largely due to a program of screening all overseas travellers 10 days after arrival in NSW.

How much transmission is occurring in NSW?

All new cases who have not travelled outside of NSW are investigated by public health staff to determine the likely source of infection and identify clusters (group of cases sharing a common source or links). To understand the extent of community transmission, locally acquired cases who have had contact with a confirmed case or who are part of a known cluster are considered separately to those with an unidentified source of infection. Cases with no source identified suggest that there are people infected with COVID-19 in the community who have not been diagnosed.

In March, when the number of new cases diagnosed each day was high, public health efforts were focussed on contact tracing to limit further spread in the community. With a decline in cases, increased attention is given to identifying the source of infection for every case. High rates of testing are needed to ensure cases are identified as quickly as possible. Careful attention is given to understanding where transmission is occurring as social distancing measures are relaxed.

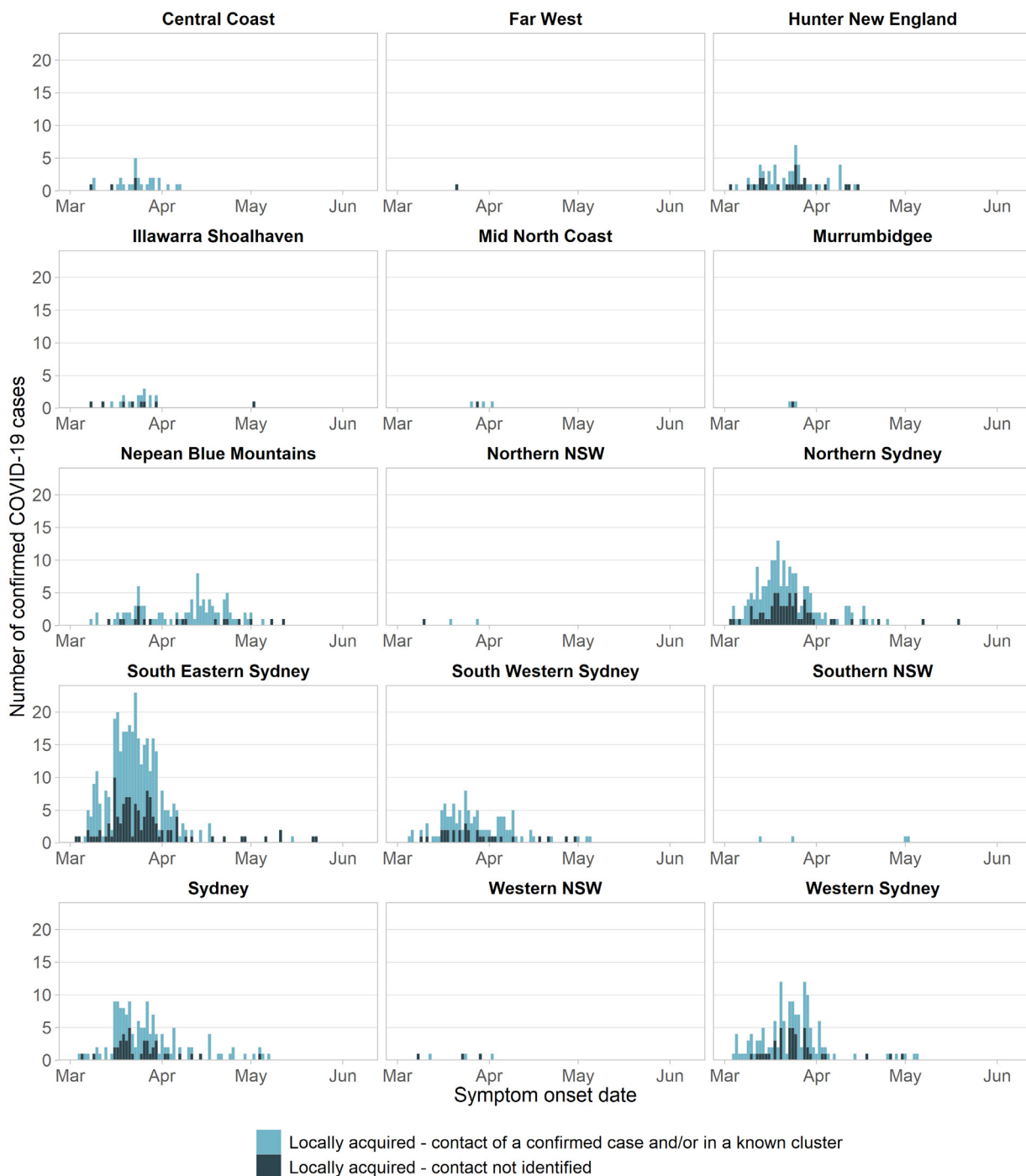
Figure 2. Locally acquired COVID-19 cases by onset of illness per day, NSW, 2020



Note: For asymptomatic cases or where symptom onset date is not available, the onset date is calculated from the earliest specimen collection date.

Interpretation: Larger clusters occurred in NSW before many of the strict social distancing rules were introduced. Since this time, there has been a decline in both the COVID-19 cases known to have had contact with a confirmed case or who are part of a cluster and those with an unknown source. The number and size of clusters will be closely monitored as changes to social distancing rules are implemented. There was one person reported in the last week whose source is under investigation. The person had travelled internationally earlier in the year and they have no obvious local source of infection. The person reported no symptoms. Serological testing suggests that the infection may have been acquired in the last few weeks. Contact tracing has been completed as part of the public health response to the case.

Figure 3. Locally acquired COVID-19 cases by onset of illness per day, NSW, 2020



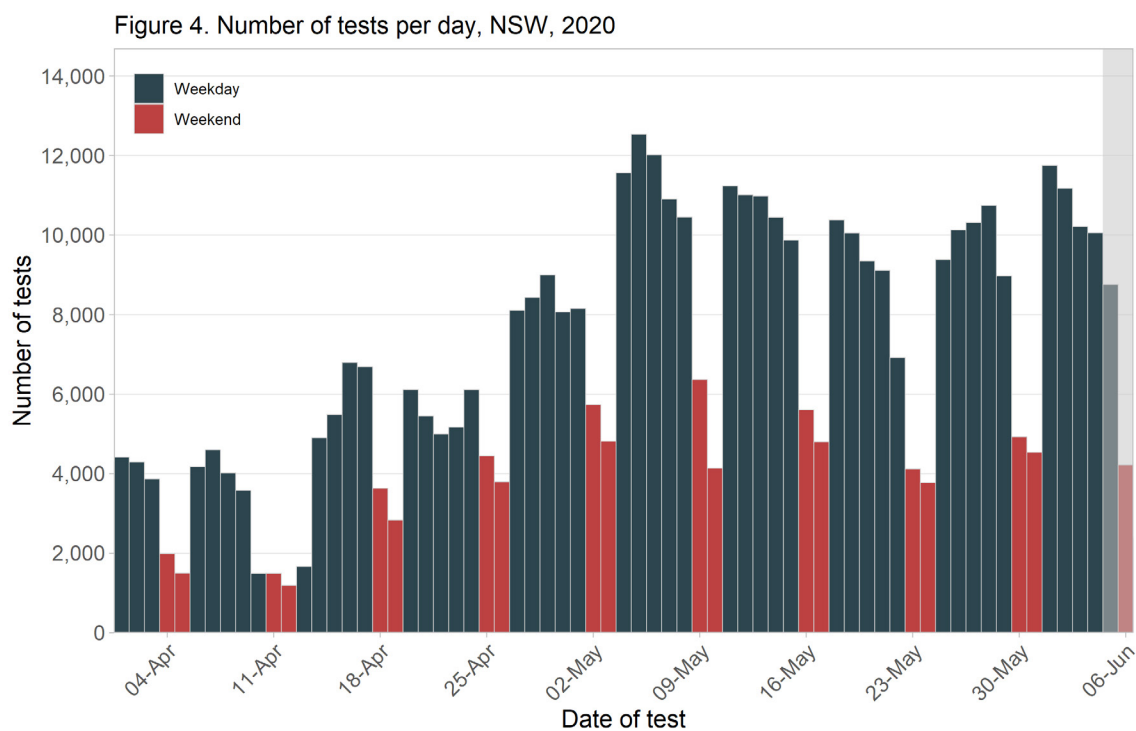
Note: For asymptomatic cases or where symptom onset date is not available, the onset date is calculated from the earliest specimen collection date.

Interpretation: Early in the outbreak cases more commonly occurred in people living in metropolitan Sydney (particularly in South Eastern Sydney and Northern Sydney LHDs) and this likely reflected the residence of travellers who returned from high-risk countries. During April there was an increase in cases in Nepean Blue Mountains LHD, largely due to an outbreak in the Anglicare Newmarch House aged care facility. The last case associated with this outbreak had an onset on 4 May. There has been very limited transmission detected in regional and rural areas and minimal transmission identified throughout all of NSW in recent weeks.

How much testing is happening?

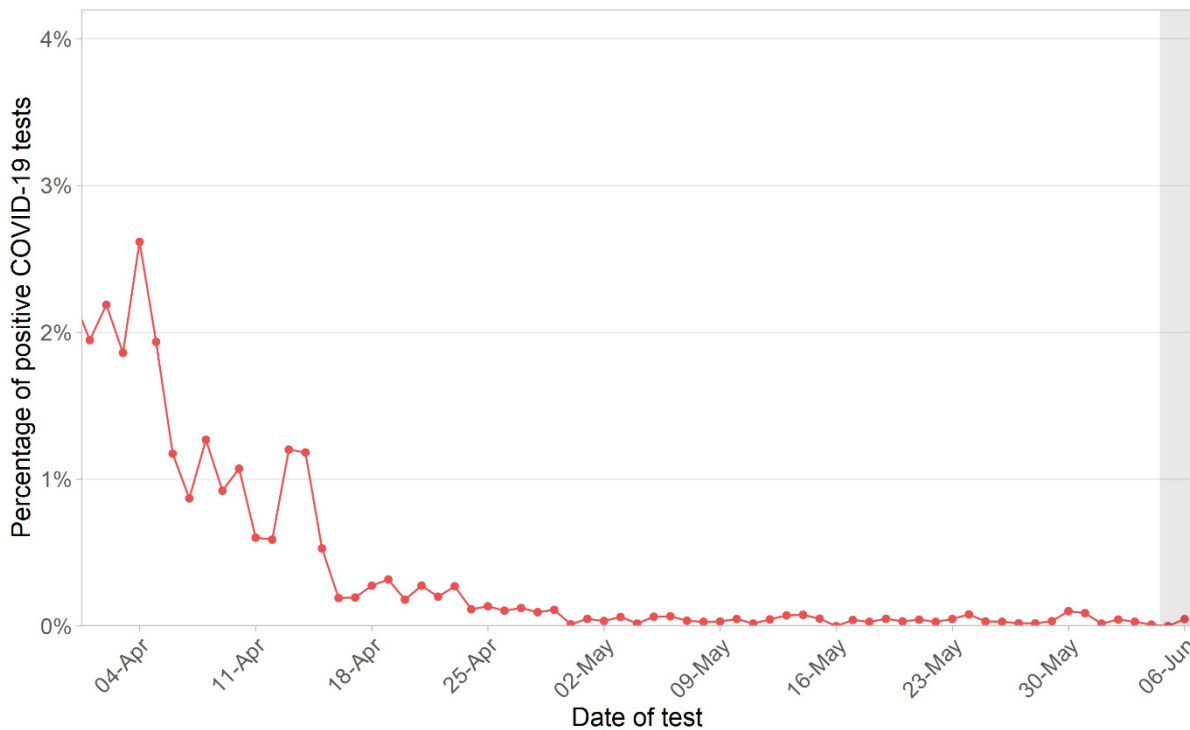
The number and rates of diagnostic tests in the population are monitored very closely in NSW. The bars on the graph below show the number of tests by the date a person presented for the test. It is important to note that:

- To enable prompt public health action, laboratories prioritise notification of all positive results to Public Health over negative test results.
- The number of tests per day displayed below is different to the 24 hour increase in tests reported each day as there are delays in some laboratories providing negative results to NSW Health.
- The shaded area in the graph below indicates dates where counts may be incomplete due to a delay in the reporting of negative tests.
- While public health facilities are open seven days a week, less testing occurs through GPs and private collection centres on weekends and public holidays. This explains the lower number of tests on weekends.



Interpretation: COVID-19 testing increased significantly in April and early May in line with the changes in the criteria for testing and increased availability of testing. Early in the outbreak the focus was on returning travellers whereas now testing is recommended for anyone with even mild respiratory symptoms or unexplained fever.

Figure 5. Proportion of tests positive for COVID-19, NSW, 2020



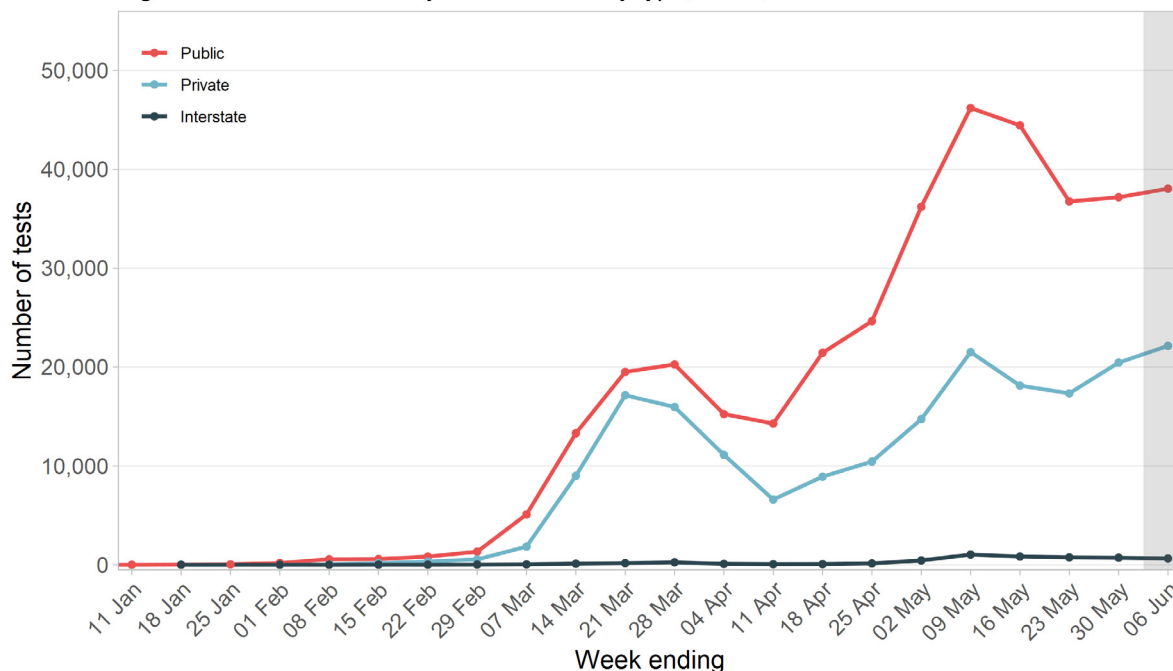
Note: PCR tests performed after becoming a confirmed case are excluded.

Interpretation: The number of people diagnosed and proportion of tests positive for COVID-19 in NSW declined since mid-March to early May, and has stabilised at very low levels since, despite the high rates of testing. This suggests there is currently limited transmission in the community.

High rates of testing are critically important to identify and isolate people who are infectious and to allow contact tracing (quarantining of all people potentially infected by a case) to limit the spread of infection. Testing is not recommended for those without symptoms except in special settings when cases have been identified such as aged care, health care, disability homes and schools.

Which laboratories are doing the testing?

Figure 6. Number of tests by week and facility type, NSW, 2020



*Note: This includes retests and is not person unique.
Once confirmed as a case, a person's further tests are not counted
Shading indicates current week, which underestimates testing due to a delay in importation or receipt of negative results
Weeks with less than three cases by facility type have been excluded*

Interpretation: About twice as many tests are done in public laboratories compared with private laboratories. The number of tests performed in public and private laboratories increased this week.

SECTION 2: COVID-19 TRANSMISSION IN NSW IN THE LAST FOUR WEEKS

To understand the extent of COVID-19 transmission in the community, public health staff carefully consider information collected from each new case at the time of diagnosis. The following analysis is for people who acquired their infections locally and reported by the date of their onset of illness. Note: This analysis differs from Table 1, which is presented by date of report.

COVID-19 has an incubation period of up to 14 days which means that cases were exposed to COVID-19 in the 14 days prior to the day their symptoms started. Information from cases who became unwell in the last month is used to understand where COVID-19 is spreading in the community. This takes into account the time it takes for people to be tested and the laboratory to perform the test. Some people who have tested positive to COVID-19 do not report having any symptoms despite thorough investigation. As it is not possible to determine when these cases were infected they are excluded in a review of recent transmission.

Table 2. Symptomatic locally acquired COVID-19 cases in NSW, by week of onset and source of infection, 10 May to 6 June 2020

Locally acquired cases	Week of onset			
	6 June	30 May	23 May	16 May
Contact of a confirmed case and/or part of a known cluster	0	0	0	1
Source not identified	0	0	3	2
Total	0	0	3	3

Interpretation: There were no locally acquired cases reported with onset of illness in the last two weeks. No known outbreaks were reported in the week ending 6 June. Of the six locally acquired cases who had an onset in the last four weeks three were students who attended school during their infectious period, two cases were reported in adults with no links to known cases, and one case was a household contact of one of the adult cases. All cases were promptly isolated and all close contacts were quarantined.

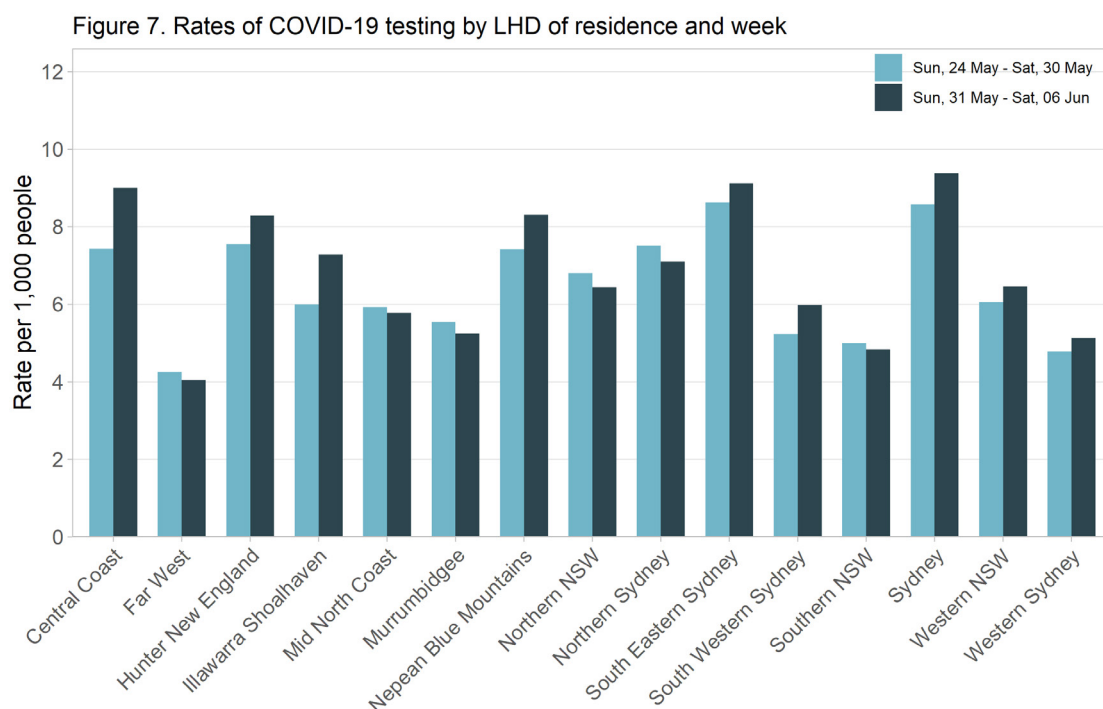
While it is encouraging that the number of people without a known source of infection remains low, high rates of testing are required to rapidly identify cases to prevent the spread of infection. This is especially important as social distancing rules relax. Maintaining 1.5 m distance between others limits the opportunity for transmission between people.

Cases and testing by Local Health District of residence

Table 3. Symptomatic locally acquired COVID-19 cases by Local Health District of residence and week of onset, 10 May to 6 June 2020

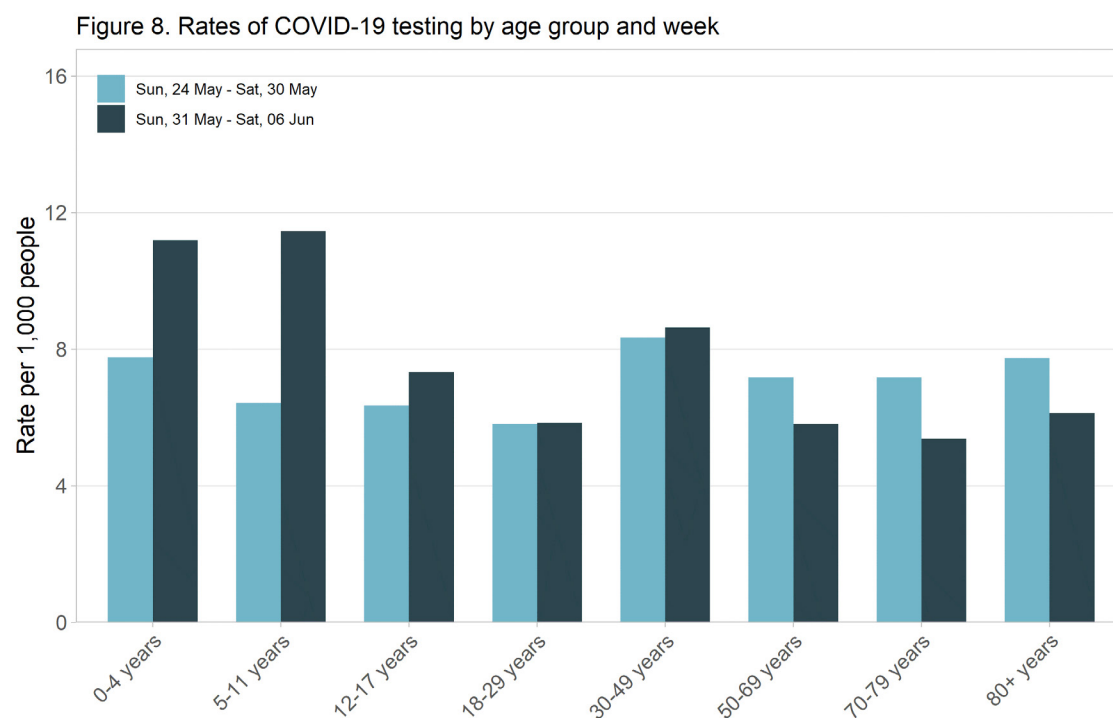
Local Health District	Week of onset			
	6 June	30 May	23 May	16 May
Central Coast	0	0	0	0
Far West	0	0	0	0
Hunter New England	0	0	0	0
Illawarra Shoalhaven	0	0	0	0
Mid North Coast	0	0	0	0
Murrumbidgee	0	0	0	0
Nepean Blue Mountains	0	0	0	0
Northern NSW	0	0	0	0
Northern Sydney	0	0	1	0
South Eastern Sydney	0	0	2	3
South Western Sydney	0	0	0	0
Southern NSW	0	0	0	0
Sydney	0	0	0	0
Western NSW	0	0	0	0
Western Sydney	0	0	0	0
Grand Total	0	0	3	3

Interpretation: There were no locally acquired cases with symptom onsets in the last two weeks. Most locally acquired cases with onset in recent weeks have been reported from metropolitan Sydney. This does not mean that the infection was acquired in that area, as many people travel outside their place of residence for work or other reasons. No links were identified between the cases with an unknown source notified in the four-week period.



Interpretation: South Eastern Sydney, Sydney, and Central Coast LHDs reported the highest rates of testing in the week ending 6 June. Testing rates were higher or similar this week in most LHDs when compared with the previous week. A table of testing rates by LGA for the last two weeks is in Appendix A.

Testing by age group

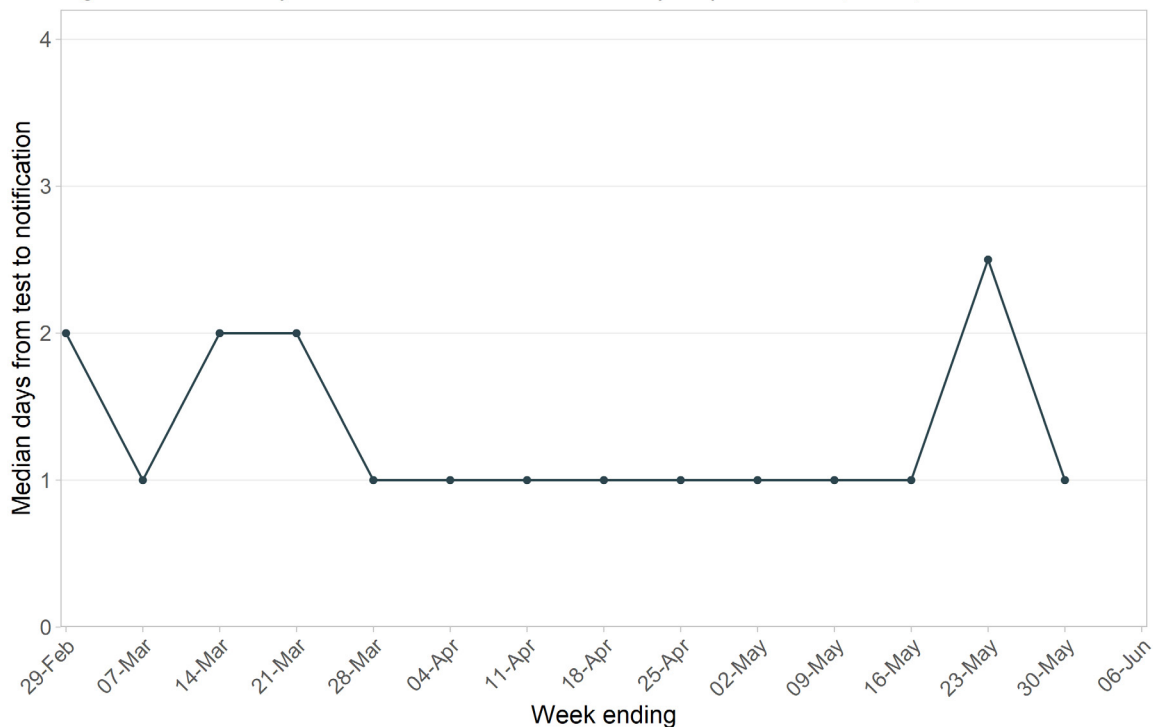


Interpretation: Testing rates increased significantly in the week ending 6 June in school-aged children compared to the previous week. Rates of testing in older age groups decreased this week. Overall, testing rates were slightly higher in NSW in the week ending 6 June when compared to the previous week.

How long does it take to get a positive COVID-19 test result?

To enable prompt public health action, laboratories prioritise the notification of positive COVID-19 test results to NSW Health.

Figure 9. Median days from test to notification for locally acquired cases, NSW, 2020



Interpretation: Despite marked increases in testing overall, the time from testing to notification has remained stable and is generally one day for locally acquired cases. Since the week ending 16 May, there have been less than 10 locally acquired cases per week. In the week ending 23 May there were only two cases reported, and the times for confirmation were one day and four days. The delay was due to an indeterminate result needing to be confirmed by a reference laboratory.

Cases in pregnant women

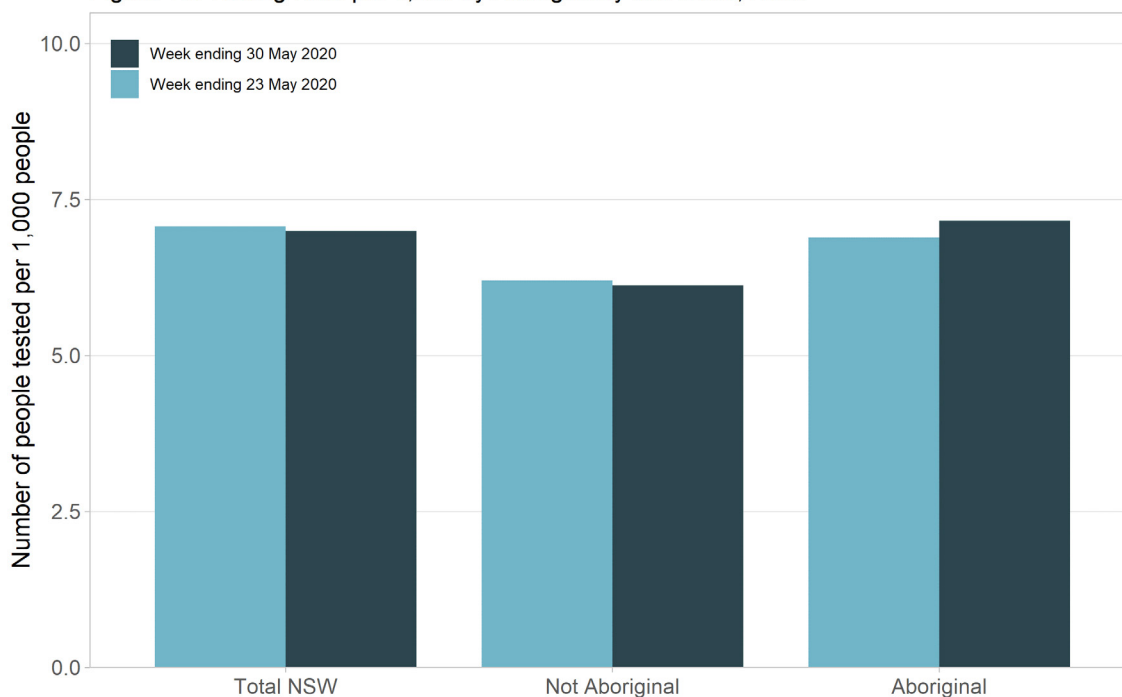
There have been no new cases in pregnant women in the week ending 6 June.

Cases and testing in Aboriginal people

There have been no new cases among Aboriginal people in the week ending 6 June. The most recent COVID-19 case in an Aboriginal person was reported in the week ending 30 May, who acquired their infection overseas.

While Aboriginal status is collected by public health staff on interview with the case at the time of diagnosis, those who test negative are not interviewed. Aboriginal status for those tested can be ascertained through linkage with other health information systems but there is a delay in getting this information. Results of the most recent linkage are available for people tested up to 30 May 2020. Aboriginal status was ascertained for approximately 90% of all COVID-19 records.

Figure 10. Testing Rate per 1,000 by Aboriginality and week, NSW

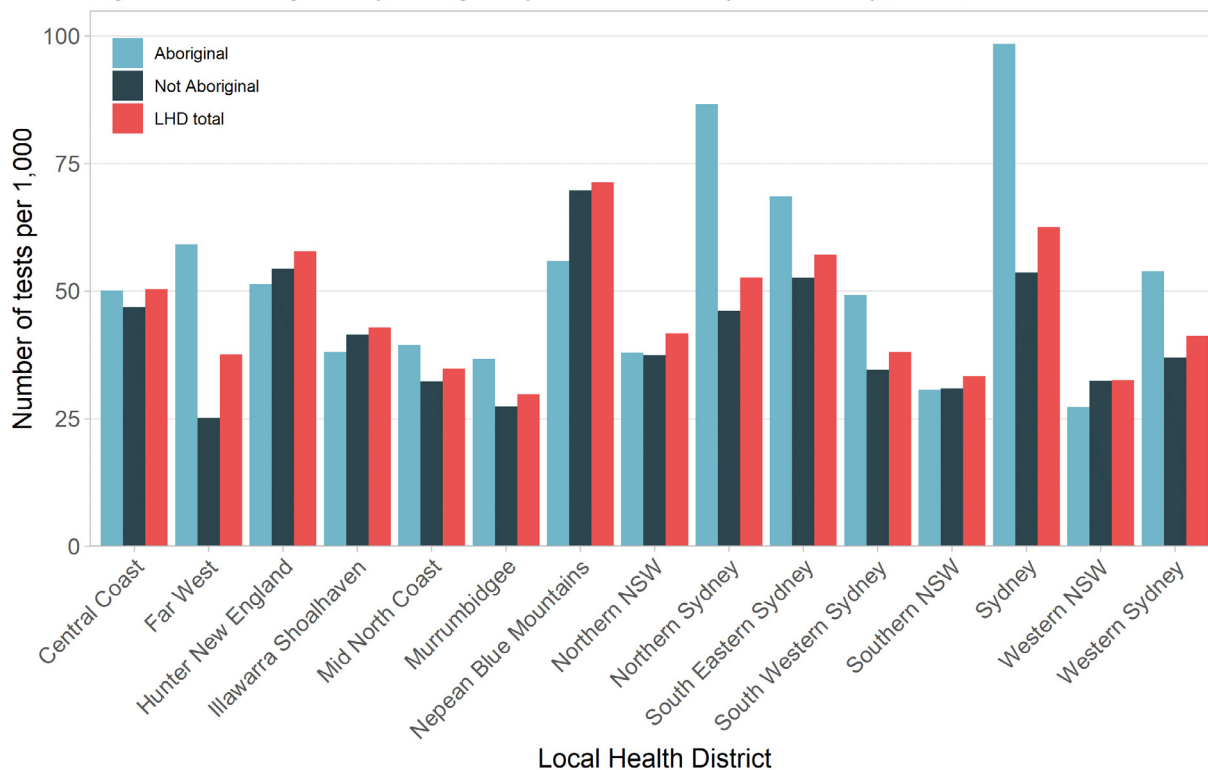


* Total rates include people with unknown Aboriginality status.

Interpretation: Similar rates of testing occurred in Aboriginal people in the week ending 30 May compared with the previous week. Testing rates in Aboriginal people are comparable with non-Aboriginal people.

The high rates of testing and low case counts suggest limited COVID-19 transmission is occurring amongst Aboriginal people currently. Continued testing of symptomatic people is critical to prevent transmission in the community in general and is especially important in the Aboriginal population. Higher rates of chronic disease factors such as high numbers of people per household and barriers to accessing health care make Aboriginal people a vulnerable group.

Figure 11. Testing rate by Aboriginality and LHD - 01 April to 30 May, NSW, 2020



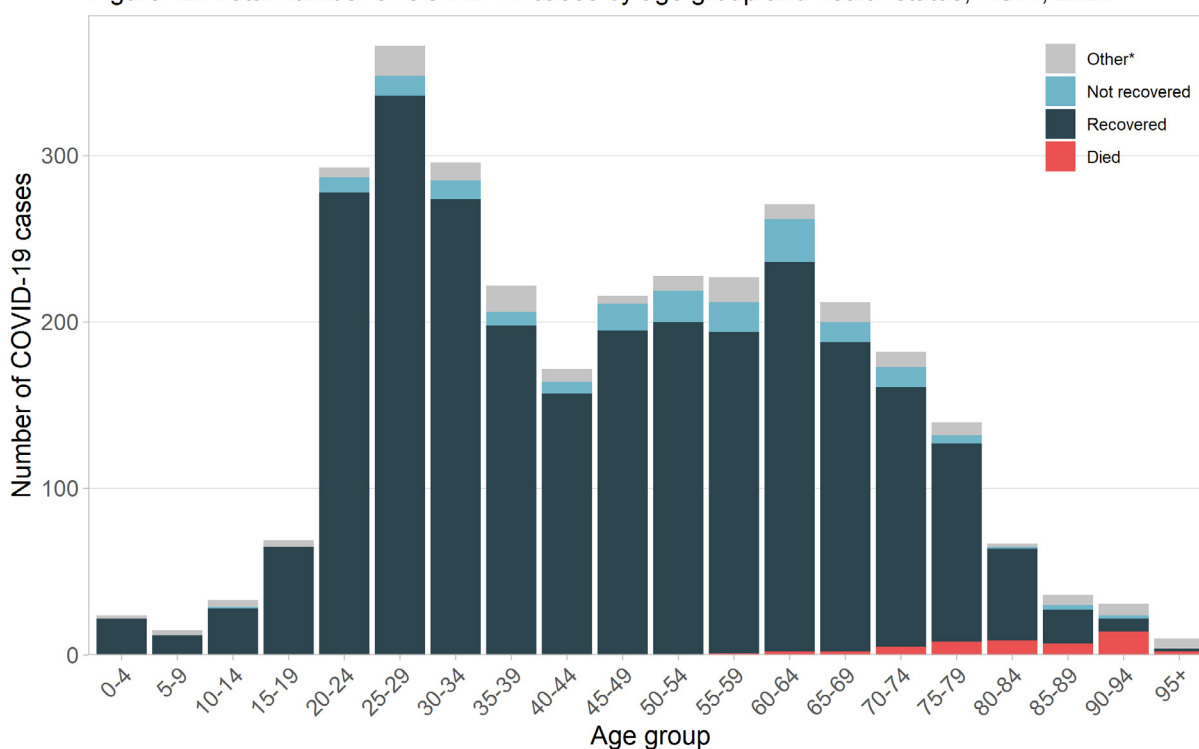
Interpretation: Testing rates by LHD were similar for Aboriginal and non-Aboriginal people in most areas apart from Sydney, Northern Sydney, South Eastern Sydney, South Western Sydney, Western Sydney and Far West LHDs where Aboriginal testing rates were higher.

SECTION 3: RECOVERY AND DEATHS

How many cases have recovered?

In NSW, recovery status for COVID-19 is assessed three weeks after the onset of illness by interviewing the case. Cases reporting resolution of all COVID-19 symptoms are considered to have recovered. Cases who have not recovered at three weeks are called in the following weeks until recovery. At the time of interview, the date of recovery is collected to understand the duration of symptoms. The bars on the figure below show the total number of cases by age group and health status up to 6 June. This includes all cases reported in NSW (acquired locally and overseas).

Figure 12. Total number of COVID-19 cases by age group and health status, NSW, 2020



*Less than 3 weeks from symptom onset and/or recovery data not available

Interpretation: Overall, more than 85% of cases have recovered.

How many people have died as a result of COVID-19?

In total, 1.6% of cases (50 people) have died as a result of COVID-19 infection, most of whom were 70 years of age or older. Of these 50, 27 were residents of aged care facilities with known COVID-19 outbreaks. Approximately one-quarter of the deaths were in people who acquired COVID-19 overseas.

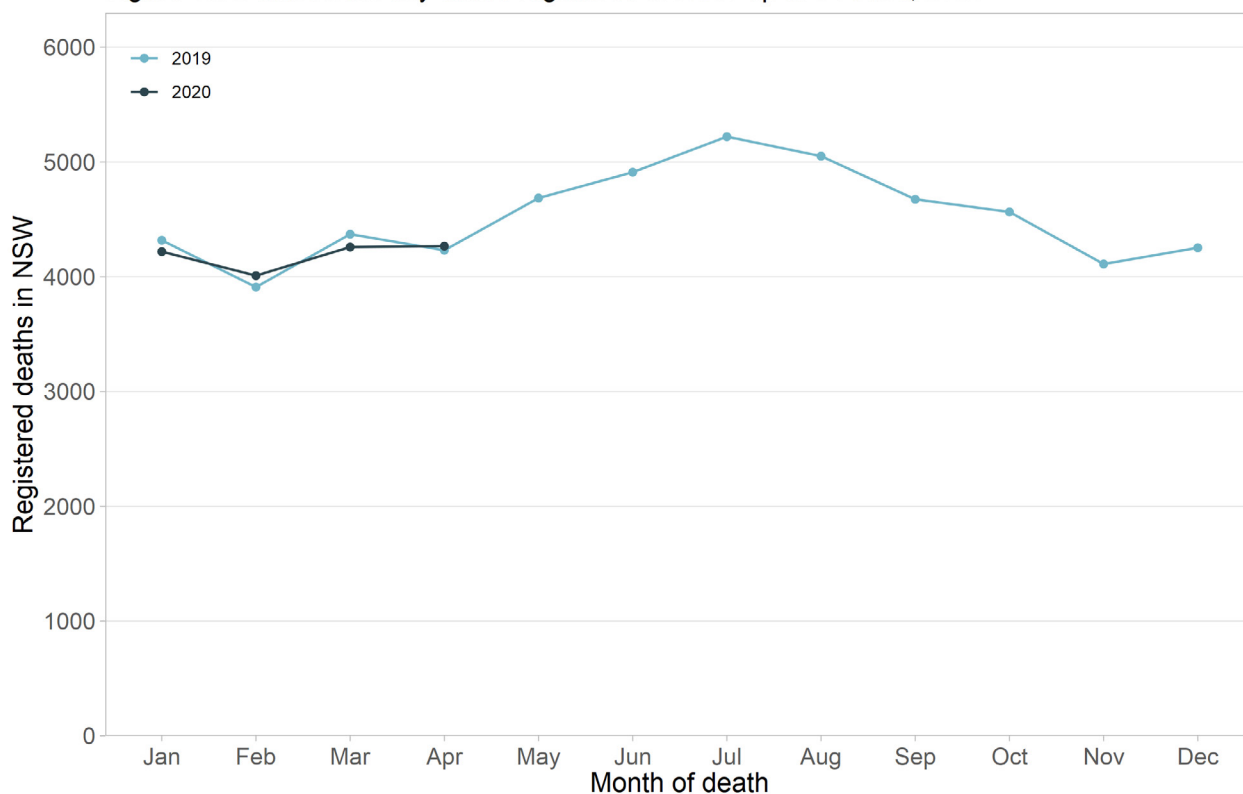
Internationally it is estimated that 5.8% of COVID-19 cases are reported to have died as a result of their infection.¹ Countries such as Italy, the United Kingdom and Spain have reported higher mortality rates (14.4%, 14.2% and 11.2%), while NSW reports similar rates to South Korea (2.3%) and New Zealand (1.9%).

¹ WHO Coronavirus disease (COVID-19) Situation Report – 140
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>

How many people have died in NSW from any cause of death?

NSW Health receives notifications of all deaths notified to the NSW Registry of Births Deaths and Marriages. Deaths from any cause are seasonal, increasing in winter and decreasing in summer. On average there is a delay of about 14 days for a death to be registered and notified to NSW Health, and deaths referred to a coroner may take longer to register.

Figure 13. Deaths from any cause registered in NSW up to 04 June, 2020

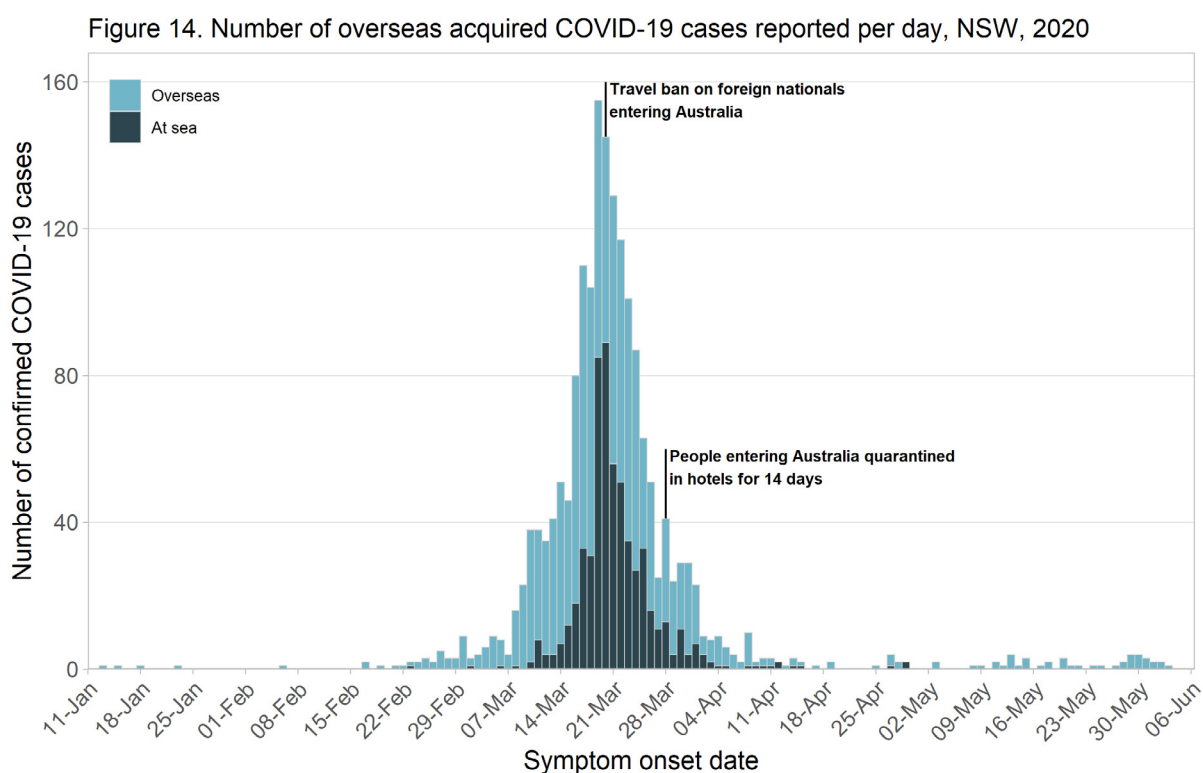


Interpretation: In March 2020, the numbers of deaths registered to date are lower compared to the same period in 2019, while it is almost the same for April. While there is a lag in notification of deaths, there is no indication to date that the COVID-19 pandemic in NSW is causing an overall increase in mortality.

SECTION 4: COVID-19 IN RETURNED TRAVELLERS

To limit the spread of COVID-19 into NSW, travel restrictions were introduced for all non-Australian citizens and permanent residents. In addition, since 28 March returned travellers have been quarantined in hotels for a 14-day period and travellers who develop symptoms are isolated until no longer infectious.

The graph below shows the number of cases in returned travellers by the date of symptom onset. Cases acquired at sea refers to those cruise ship passengers who acquired their infection on board prior to disembarking in NSW.



Interpretation: The number of new cases in returned travellers has decreased markedly in line with travel restrictions. Returned travellers account for 70% (n=43) of cases reported in NSW in the last four weeks (n=61). In this time period, most had returned from Pakistan (n=18), followed by India and the United Kingdom (n=6). The country where people acquired their infection in recent weeks is influenced by large repatriation flights. Since the end of March all people entering Australia have been quarantined in hotels for 14 days.

Overall, cruise ship passengers (including cruises which disembarked outside Australia) accounted for the largest number of overseas acquired infections (581 cases). Following this, cases were most commonly returning from the United Kingdom (322 cases), United States (273 cases) and New Zealand (54 cases).

Airport screening

Health screening of returning travellers was introduced for people returning from particular countries early in the outbreak but was expanded to all returning travellers (on 21 March 2020). As part of the health screening passengers are asked to complete a questionnaire about their health upon arrival into Sydney International Airport. People with symptoms are assessed by an onsite health team and tested for COVID-19.

During the week of Sunday 31 May to Saturday 6 June, 3,173 people were screened at Sydney International Airport and 21 were referred for testing. Since screening began on 2 February, a total of 74,948 people have been screened and 840 were referred for onsite health assessment and testing.

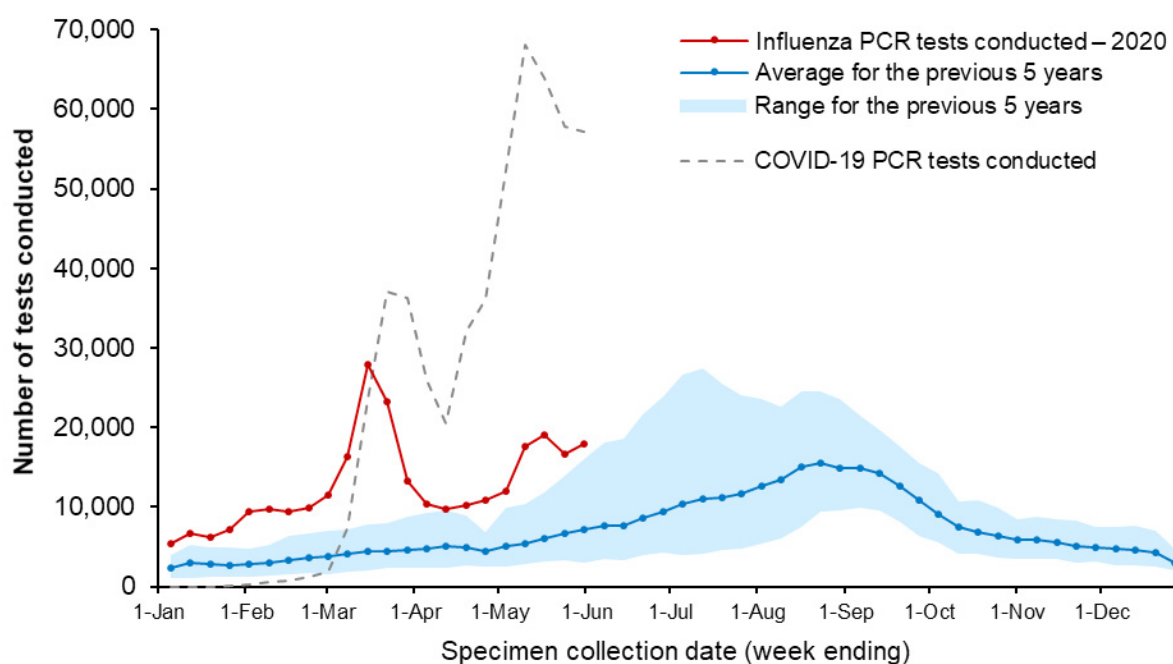
SECTION 5: OTHER RESPIRATORY INFECTIONS IN NSW

Influenza and other respiratory virus reported in NSW, up to 24 May 2020

In NSW, sentinel laboratory surveillance for influenza and other respiratory viruses is conducted throughout the year. The number of PCR tests conducted and the results are provided by participating sentinel laboratories on a weekly basis. The reported testing numbers reflect the number of influenza PCR tests conducted; not all samples are tested for all of the other respiratory viruses.

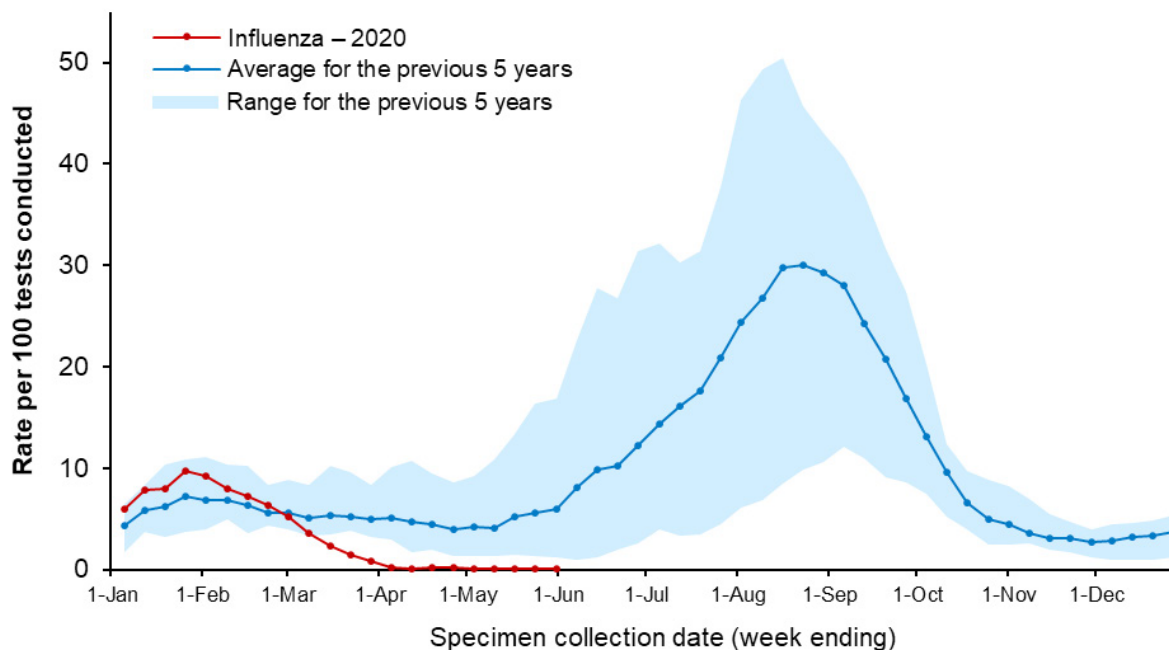
A total of 280,203 tests for influenza have been performed at sentinel NSW laboratories in 2020, with 17,956 PCR tests conducted in the week ending 31 May 2020. Rhinovirus is the leading respiratory virus identified by laboratories this year. This week the number of rhinovirus cases increased, although remains within the usual range for this time of year (see Appendix B for table of test results).

Figure 15. Number of influenza tests conducted at sentinel NSW laboratories per week, 1 January to 31 May 2020 (red line), compared with the previous 5 years



Interpretation: There is an increase in influenza testing activity overall for this time of year. The peak in influenza testing during March corresponds to testing for COVID-19 virus. The subsequent decline of influenza testing, and sharp increase in COVID-19 testing from early April, reflects changes in testing practices for COVID-19 introduced in late March so that testing for influenza and other respiratory viruses was by exception to enable laboratories to increase COVID-19 testing using common equipment. Influenza testing has substantially increased since then, and testing rates remain above previous years.

Figure 16. Weekly rate of influenza detected by PCR per 100 tests conducted at sentinel NSW laboratories, 1 January to 31 May 2020 (red line), compared with the previous 5 years



Interpretation: This graph shows the weekly number of positive PCR tests for influenza for every 100 tests conducted at sentinel NSW laboratories between 1 January and 31 May 2020. The number of people diagnosed with influenza has been declining since early February. This suggests there is currently limited transmission in the community. The influenza percent positive rate for the week ending 31 May was 0.03%, remaining at a very low rate since the beginning of April.

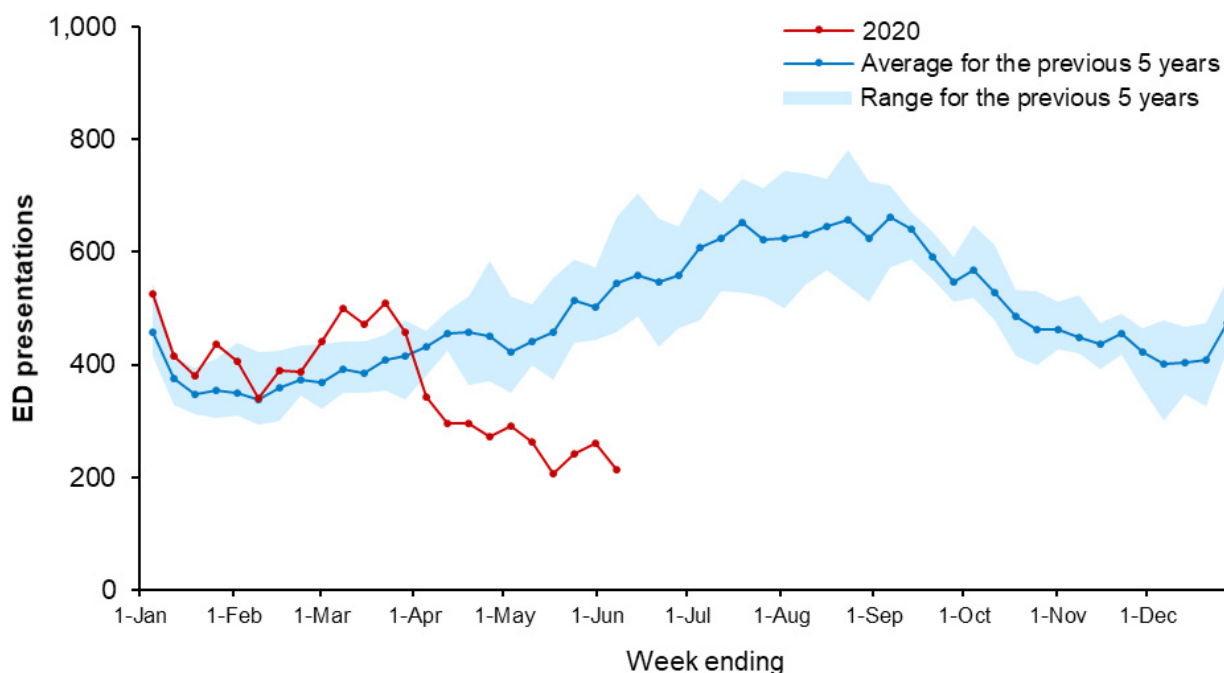
How many people have died as a result of influenza?

There have been 12 influenza deaths identified using Coroner’s reports and death registrations with laboratory-confirmed influenza reported for the year to date. Two-thirds of the deaths were in people aged 65 years and over. In 2019, for same period of time, there had been 43 laboratory-confirmed influenza deaths.

How many emergency department presentations have there been for pneumonia?

NSW emergency department (ED) surveillance for presentations of pneumonia includes ED presentations with diagnoses of viral, bacterial, atypical or unspecified pneumonia, and legionnaires disease, but excludes ‘pneumonia with influenza’ and provides an indicator of more severe respiratory conditions using PHREDSS.²

Figure 17. Total weekly counts of ED visits for pneumonia, all ages, 1 January to 7 June 2020 (red line), compared with the 5 previous years



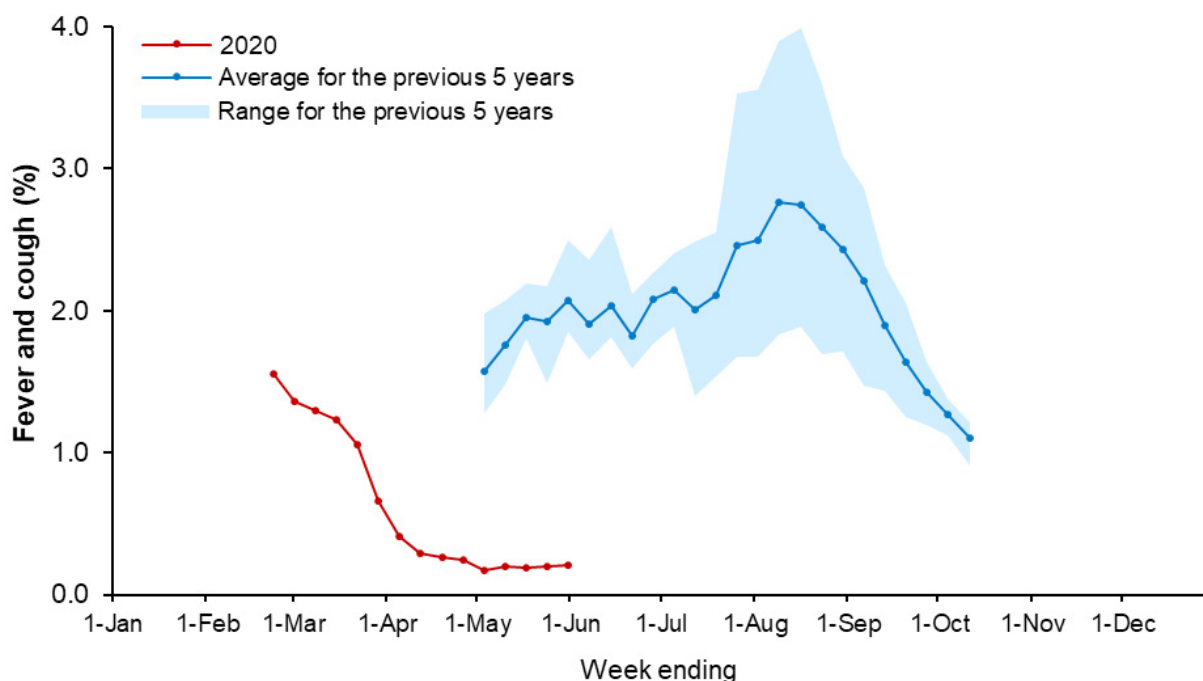
Interpretation: Pneumonia presentations decreased from the end of March and remain below the usual range for this time of year.

² NSW Health Public Health Rapid, Emergency Disease and Syndromic Surveillance (PHREDSS) system, CEE, NSW Ministry of Health. Comparisons are made with data for the preceding 5 years. Includes unplanned presentations to 67 NSW emergency departments (accounts for 87% of total public ED activity).

How many people have flu-like symptoms in the community?

FluTracking is an online survey that asks if you have had typical flu-like symptoms, such as fever or cough, in the last week. Across NSW approximately 25,000-30,000 people participate each week. Due to the COVID-19 outbreak the FluTracking survey started at the end of February; in previous years the survey commenced at the beginning of the regular flu season in May.

Figure 18. Proportion of people reporting influenza-like illness, 1 January to 31 May 2020 (red line), compared with the 5 previous years, NSW



Interpretation: In NSW in the week ending 31 May, of the 25,517 people surveyed, 53 people (0.21%) reported typical flu-like symptoms. The proportion of people reporting symptoms remains below the usual range for this time of year, likely partly due to the response to the COVID-19 outbreak, in particular the decrease in overseas travel, community restrictions and social distancing.

IN FOCUS

COVID-19 HOSPITALISATIONS IN NSW

Reporting period: 1 January to 19 April 2020

The following report describes hospital admissions among people diagnosed with COVID-19 in NSW.

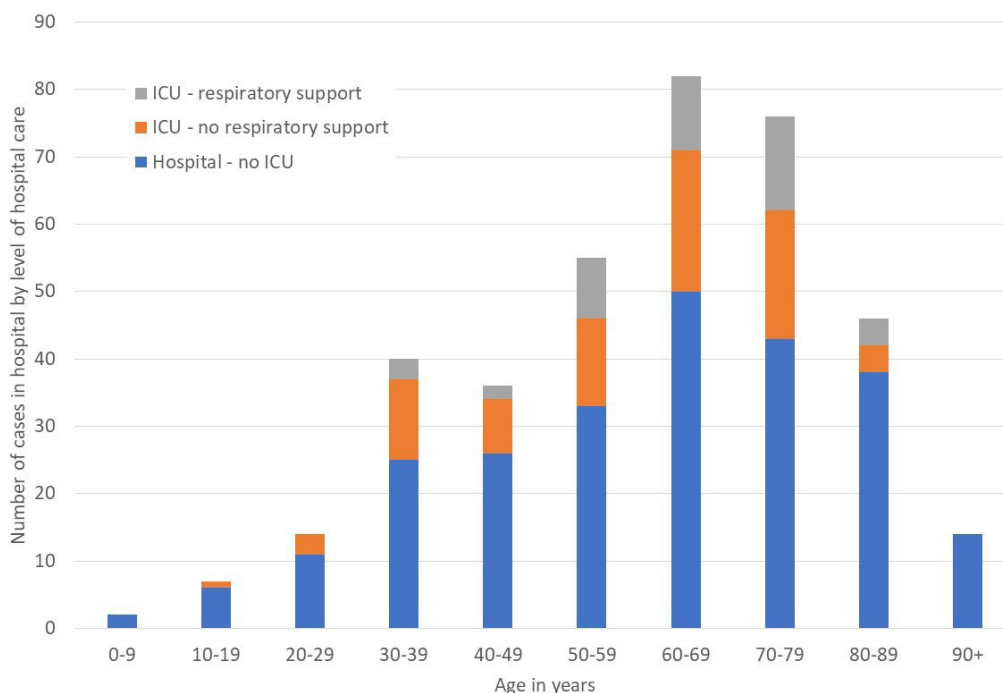
Hospital admissions for COVID-19 cases from the NSW Admitted Patient Data Collection (APDC) and the Notifiable Conditions Information Management System (NCIMS) were linked. The APDC includes data reported from all public hospitals in NSW (excluding the Northern Beaches Hospital) and includes information on the admission dates, wards, and diagnostic information. The NCIMS data includes notifications of all confirmed cases of COVID-19 reported to NSW Public Health Units. The NCIMS data includes demographic information on the case, symptoms, date of disease onset, and information on testing. It also includes information collected by the Public Health Unit on hospitalisation – generally at the time of diagnosis. The completeness of people who were admitted to hospital in NCIMS relies on information collected through interview with the case. On initial comparisons with the APDC only two-thirds of hospitalisations on the APDC were captured in the NCIMS data. Therefore the primary source of hospitalisation data used in this report was the NSW APDC data with the NCIMS used to supplement this information.

As there is a delay in receipt of APDC data, only people diagnosed in NSW from 1 January up to 19 April 2020 were included in this report to allow for sufficient time for hospitalisations in COVID-19 cases to be captured. Hospital admissions are counted in this report where the COVID-19 diagnosis is at least two weeks before or six weeks after the onset of illness. This does not necessarily mean all hospitalisations were attributable to the COVID-19 diagnosis. The hospitalisations counted include only in-patient hospital stays, and exclude day-only hospitalisations, Hospital in the Home, and those only in emergency departments or ward types not routinely used for COVID-19 admissions.

How many people with COVID-19 have been hospitalised in NSW?

Hospitalisations, intensive care unit (ICU) admissions and need for respiratory support are all markers of increasingly severe disease among people with COVID-19.

Number of people with COVID-19 hospitalised in NSW by age and level of hospital care



Interpretation: In NSW there were 2,988 people with COVID-19 diagnosed up to 19 April 2020. Of these, 372 had an inpatient hospitalisation that was related in time to their COVID-19 diagnosis, 124 had an ICU admission, and 43 required a form of respiratory support. The highest numbers of hospitalised cases were in those aged 60-69 years (82) with the lowest among those 0-9 years (2). The highest numbers of cases in ICU and on respiratory support were in those aged 70-79 years (33 in ICU; 14 with respiratory support).

Hospital admission records are routinely reviewed following discharge to assign diagnosis codes. Each record is assigned a primary diagnosis code and can have further diagnosis codes as well. Diagnostic information was available for 71% of cases hospitalised with COVID-19.

Hospital diagnosis code	% COVID-19 cases hospitalised*
Pneumonia or lower respiratory tract infection (LRTI)	47%
Upper respiratory tract infection or other known symptoms of COVID-19 (e.g. cough, fever) but no LRTI codes	37%

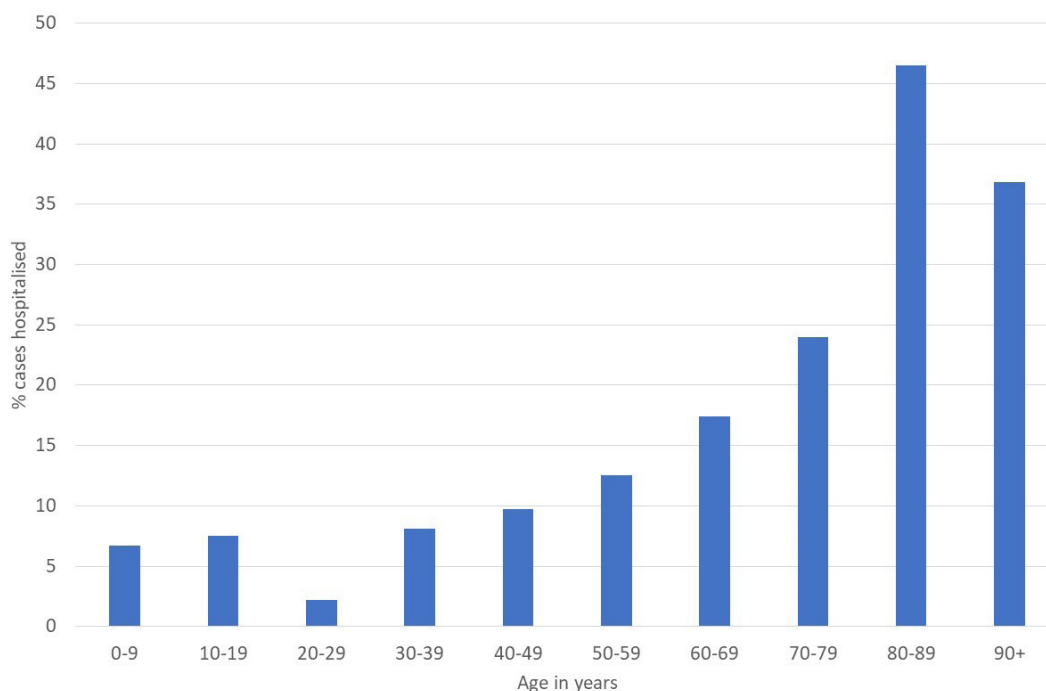
* 71% (n=267) of all hospitalised cases had diagnostic codes available in their hospital records and the proportion is calculated using this number as the denominator.

Interpretation: For almost half (47%) of all cases hospitalised, the condition contributing to their admission was pneumonia or another lower respiratory tract infection. A further 37% were hospitalised for an upper respiratory tract infection or for other known symptoms of COVID-19 (for example fever, cough, malaise).

What percentage of people with COVID-19 have been hospitalised in NSW?

The figure below shows the percentage of cases in each age group that were hospitalised for COVID-19.

Percentage of COVID-19 cases hospitalised in NSW by age



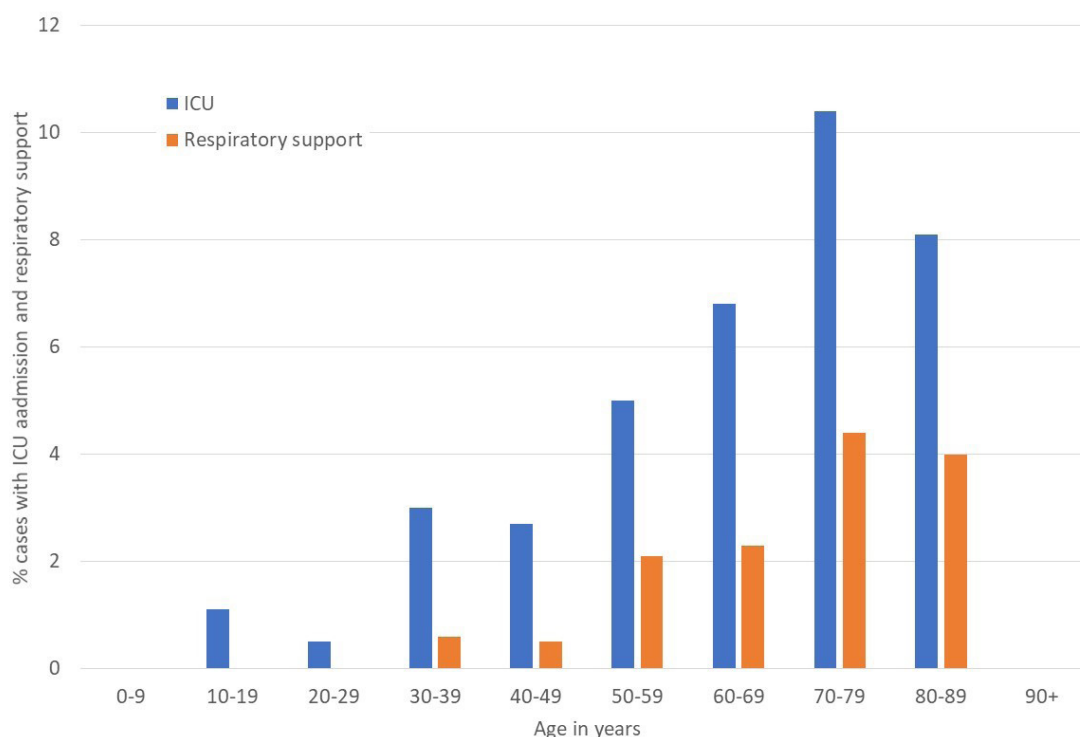
Interpretation: Overall, 12.4% (372/2988) of people diagnosed with COVID-19 in NSW have been hospitalised in NSW. The percentage of people with COVID-19 hospitalised differs substantially by age with the highest percentage among 80-89 year olds (46.5%) and the lowest in 20-29 year olds (2.2%). Among adults who were diagnosed with COVID-19, hospitalisations increased with increasing age, reflecting the greater severity of disease in older people. In those aged <20 years, the total numbers hospitalised were very low (two for those <10 years and seven for those 10-19 years). Hospitalisations in these younger age groups are likely to reflect precautionary measures rather than severity of disease (see Intensive Care Unit admissions below).

Note that people with COVID-19 who have been cared for exclusively by Hospital in the Home programs are not included in these counts. The data from the APDC on Hospital in the Home are incomplete but suggest that among COVID-19 cases aged >90 years, at least as many are cared for by Hospital in the Home programs as the number cared for as hospital in-patients.

What percentage of people with COVID-19 have been admitted to intensive care or high dependency units and required respiratory support?

Admissions to critical care and requirements for respiratory support for COVID-19 represent severe disease outcomes. The figure below shows the proportion of cases in each age group that were admitted to ICU and those who needed respiratory support. Respiratory support can include both invasive and non-invasive forms of ventilation.

Percentage of cases with Intensive Care Unit admission and respiratory support by age



Interpretation: Among people with a COVID-19 diagnosis, 4.1% (124/2988) were admitted to an intensive care unit (ICU) or high dependency unit (referred to together as ICU) and 1.4% (43/2988) required respiratory support. Intensive care unit admission was lowest in children aged <10 years (0%) and highest in those aged 70-79 years (10.4%) with ICU admissions increasing with increasing age up to the 70-79 year age group. This pattern was similar among those requiring respiratory support with no cases aged <30 years requiring respiratory support, rising to 4.4% of those aged 70-79 years requiring respiratory support. It is possible that some people with COVID-19 who were admitted to ICU may have been admitted for isolation and use of negative pressure rooms that are frequently found in the ICU setting rather than for the severity of their illness.

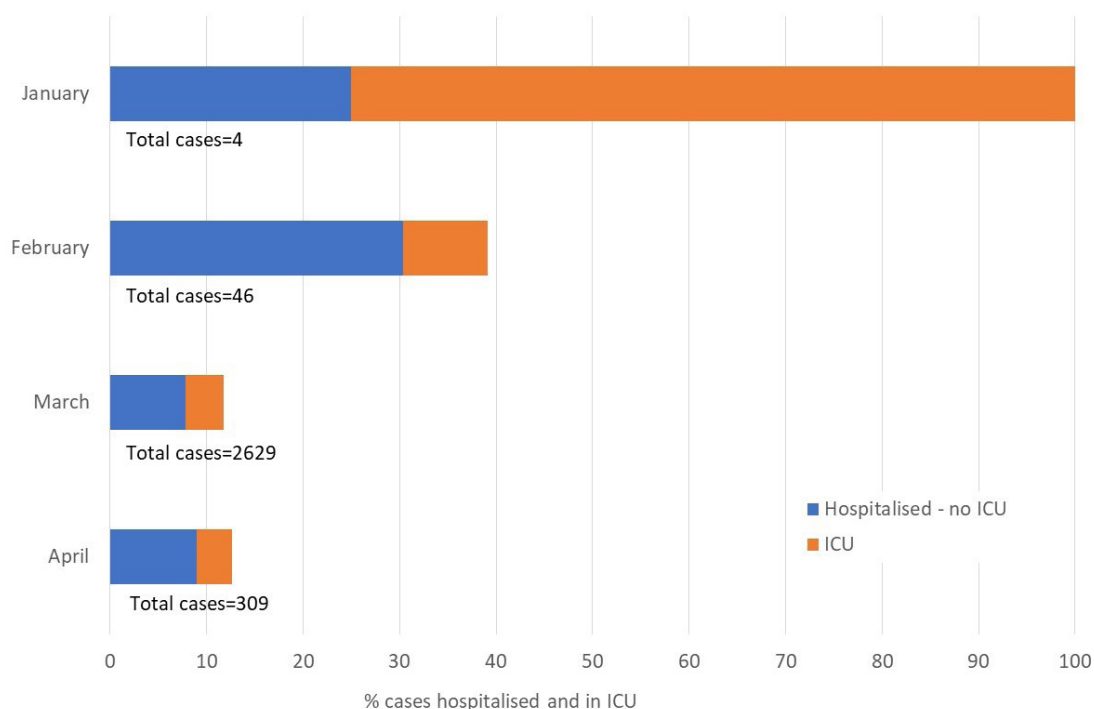
People needing respiratory support in an ICU is an indication of severe illness. The absence of people aged 90+ years admitted to ICU and on respiratory support may indicate a preference, and a desire expressed through Advanced Care Directives, for less aggressive management in the most elderly cases.

Reporting period: 1 January to 19 April 2020

How have hospitalisations in people diagnosed with COVID-19 changed over time in NSW?

Initially in the pandemic, as a precaution, all people with COVID-19 in NSW were hospitalised to isolate them and monitor the progression of the illness. The figure below shows the percentage of cases hospitalised by month of diagnosis.

Percentage of COVID-19 cases hospitalised and admitted to ICU in NSW by month of diagnosis



Interpretation: The percentage of people with a COVID-19 diagnosis hospitalised has decreased since January 2020. All four cases diagnosed in January were hospitalised and 75% were admitted to the ICU. For cases diagnosed in March and April the percentage hospitalised fell to 11.8% and 12.6% respectively and the percentage admitted to ICU was 4.0% and 3.6%. This pattern of hospitalisation and ICU admission reflects the changing approach to management of new cases since the pandemic began. For cases diagnosed since March the approach to management in hospitals and ICU is likely to more closely reflect the disease severity and clinical need.

To account for the more precautionary approach to management and isolation of cases in January and February, we examined the 2,938 COVID-19 cases diagnosed from 1 March to 19 April 2020. The total percentage of cases hospitalised and admitted to ICU was similar to that estimated for all cases (i.e. 11.9% hospitalised, 4.0% with ICU admission, 1.4% receiving respiratory support). This is because there were relatively few cases diagnosed in January and February so exclusion of these cases does not greatly affect the overall percentages estimated.

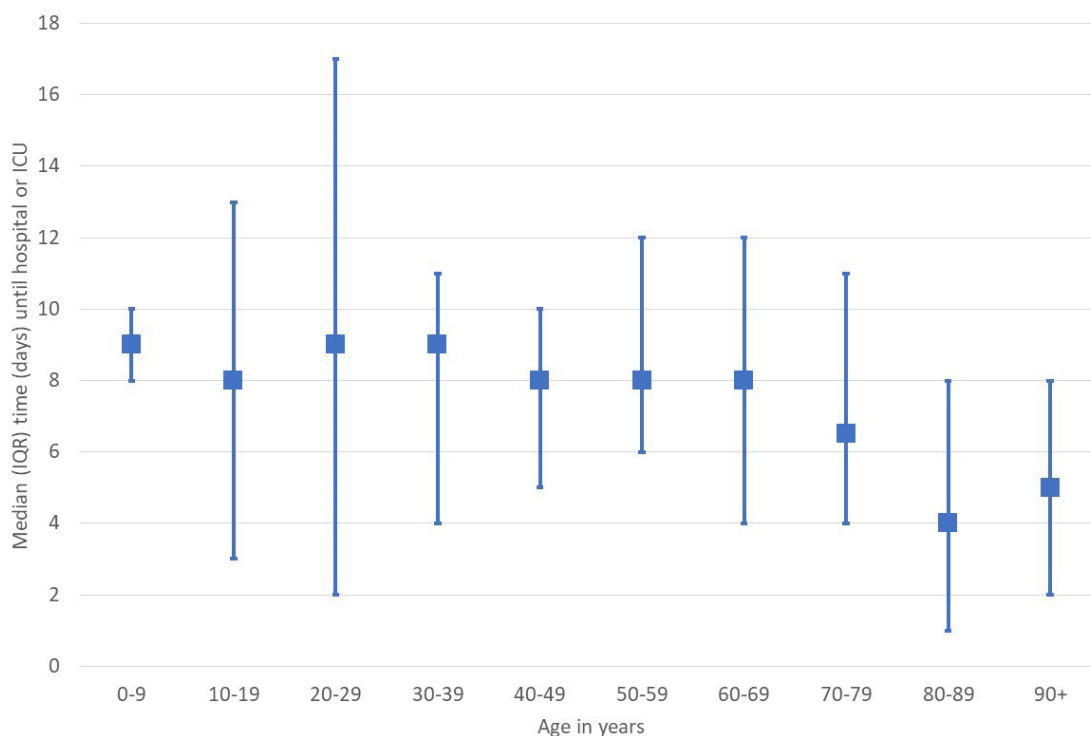
Reporting period: 1 January to 19 April 2020

How long after symptom onset are people with COVID-19 first admitted to hospital?

The time between symptom onset and first admission to hospital provides information on the clinical course of disease and how long it takes for people to become unwell enough to need hospital treatment.

In the graph below the box marks the median number of days from symptom onset to first hospital admission in each age group. The bars show the range that the middle 50% of all people who were admitted to hospital fell between. This is known as the interquartile range (IQR).

Median time (and IQR) to first hospital admission by age

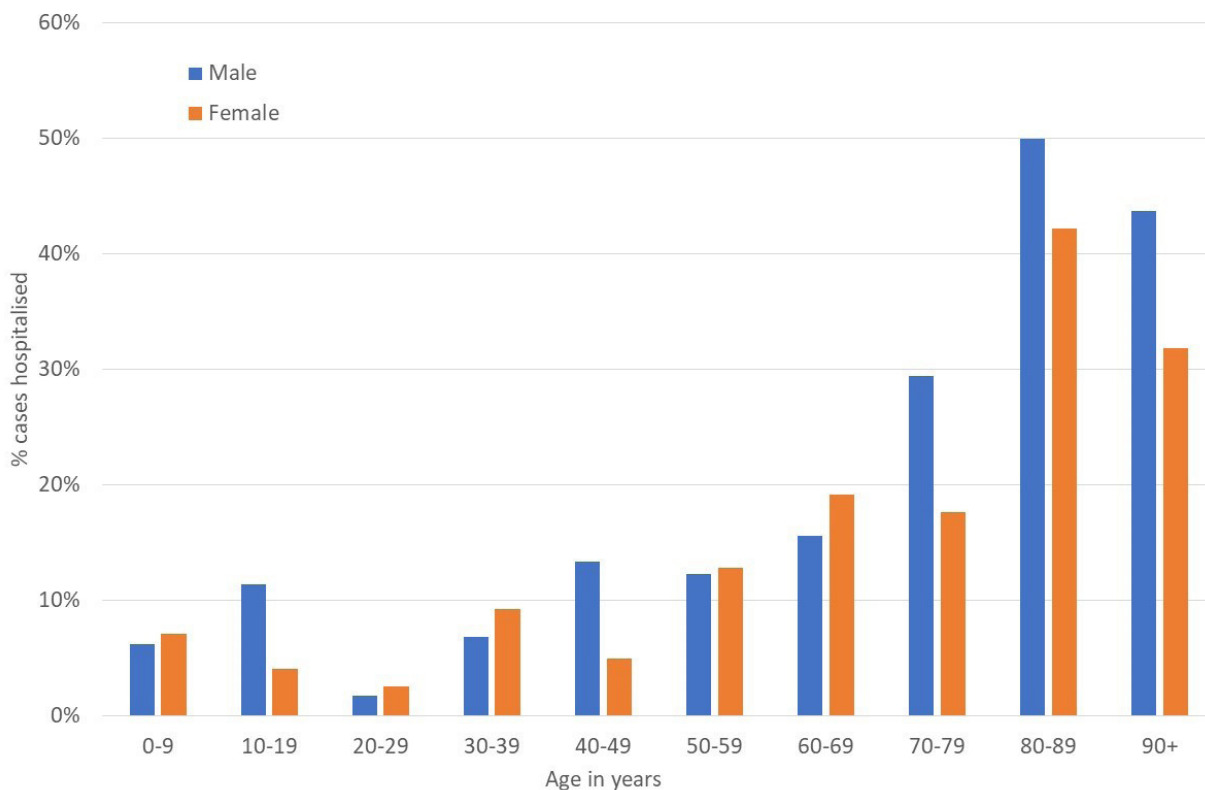


Interpretation: For cases diagnosed between 1 March and 19 April, the median time from onset of illness to first hospitalisation was 7 days, and to first ICU admission was 9 days. Among adults, the median time to hospitalisation appeared to decrease in the oldest age groups. The median time to hospitalisation in those aged 0-9, 20-29 and 30-39 years was 9 days whilst it was 4 days in those aged 80-89 years. This suggests that clinically it may take a week or longer before people with COVID-19 deteriorate and need to be hospitalised – which is consistent with reports overseas. A median of 7 days from symptom onset to hospitalisation has been reported in a case series from China.

Does the likelihood of hospitalisation and ICU stay differ between males and females?

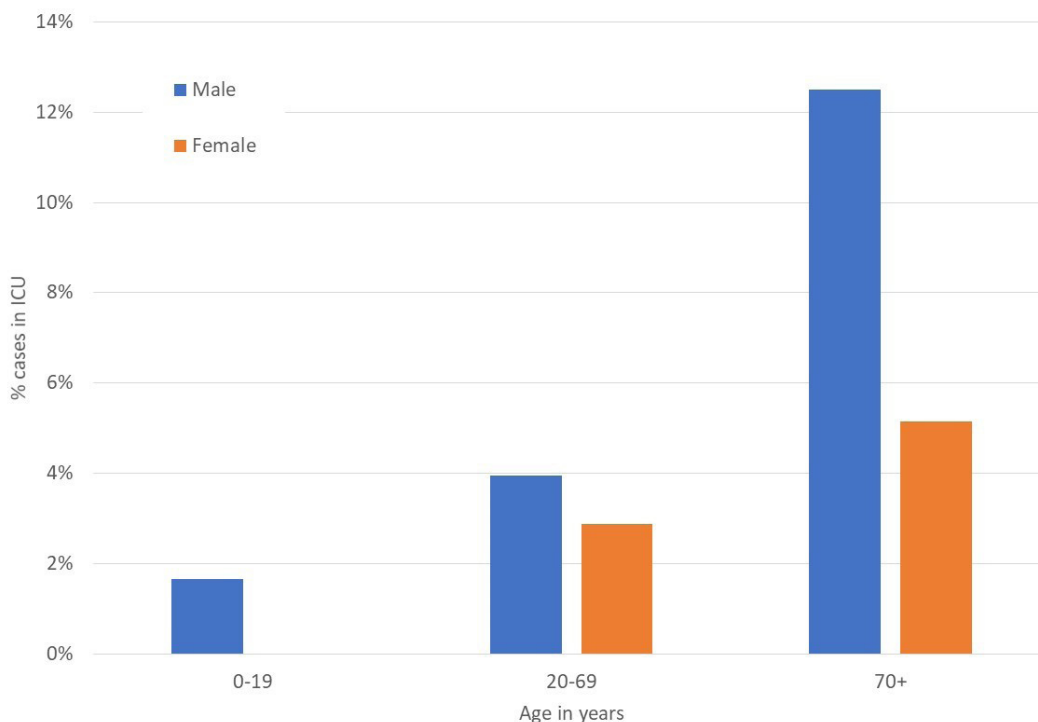
It has been reported that there are differences in the severity of COVID-19 between men and women.

Percentage of COVID-19 cases hospitalised by age and sex



Interpretation: Overall, in NSW men with COVID-19 were more likely than women to be hospitalised (13.6% vs 11.3%) and more likely to be admitted to ICU (5.2% vs 3.1%).

Percentage of COVID-19 cases in ICU by age and sex



The differences in percentages hospitalised and admitted to ICU between men and women were more pronounced in older age groups suggesting more serious disease in men, particularly those aged 70 years and over. The reasons for this sex difference may relate to higher prevalence of comorbidities in older men compared to older women but this is an area that needs further investigation.

Notes on methods: Diagnostic information in the APDC is frequently not completed until weeks after discharge and, for this reason, only limited diagnostic information was included in this report. The following ICD-10-AM codes were used to classify admissions: for pneumonia or lower respiratory tract infection (ICD-10-AM J12-J18; J20-J22); for upper respiratory tract infections (ICD-10-AM J00-J06); for other known symptoms of COVID-19 (ICD-10-AM R05-R09; R40-R43; R50-R53). Median times to first hospital and ICU admission are only reported in those with records from the APDC who reported symptoms, and for whom their admission occurred after first symptom onset. Hospitalisation data are subject to time lags due to delays in receipt of data and may change over time as new reports become available.

APPENDIX A: COVID-19 PCR TESTS IN NSW

Local Health District	Local Government Area	Week ending					
		06 June		30 May		Total	
		No.	Tests per 1,000 population	No.	Tests per 1,000 population	No.	Tests per 1,000 population
Central Coast	Central Coast / LHD Total ²	3178	9.01	2625	7.44	24865	70.47
Far West	Balranald	2	0.86	3	1.28	69	29.51
	Broken Hill	93	5.32	89	5.09	1023	58.53
	Central Darling	5	2.72	4	2.18	60	32.63
	Wentworth	22	3.12	32	4.54	307	43.53
	LHD Total ²	122	4.05	128	4.25	1459	48.4
Hunter New England	Armidale Regional	250	8.12	249	8.09	2661	86.46
	Cessnock	449	7.49	472	7.87	3241	54.03
	Dungog	72	7.64	60	6.37	468	49.67
	Glen Innes Severn	60	6.76	88	9.92	482	54.33
	Gunnedah	49	3.86	69	5.44	427	33.67
	Gwydir	12	2.24	17	3.18	136	25.41
	Inverell	166	9.83	196	11.6	1010	59.8
	Lake Macquarie	1884	9.15	1580	7.67	17445	84.73
	Liverpool Plains	50	6.33	37	4.68	480	60.74
	Maitland	1153	13.54	937	11	7601	89.25
	Mid-Coast	464	4.94	480	5.12	5271	56.17
	Moree Plains	68	5.13	103	7.77	747	56.33
	Muswellbrook	59	3.6	93	5.68	737	45
	Narrabri	71	5.41	95	7.23	619	47.13
	Newcastle	1732	10.46	1517	9.16	16834	101.67
	Port Stephens	546	7.43	501	6.82	5001	68.06
	Singleton	229	9.76	183	7.8	1668	71.1
	Tamworth Regional	451	7.21	380	6.08	5935	94.9
	Tenterfield	21	3.18	19	2.88	204	30.94
	Upper Hunter Shire	75	5.29	81	5.71	772	54.44
Uralla	27	4.49	19	3.16	314	52.23	
Walcha	19	6.06	17	5.42	219	69.88	
LHD Total ²	7894	8.29	7189	7.55	72219	75.83	
Illawarra Shoalhaven	Kiama	196	8.38	147	6.29	1602	68.5
	Shellharbour	581	7.93	485	6.62	4803	65.59
	Shoalhaven	699	6.62	602	5.7	6541	61.91
	Wollongong	1582	7.25	1284	5.89	12943	59.34
	LHD Total ²	3058	7.29	2518	6	25889	61.7

Local Health District	Local Government Area	Week ending					
		06 June		30 May		Total	
		No.	Tests per 1,000 population	No.	Tests per 1,000 population	No.	Tests per 1,000 population
Mid North Coast	Bellingen	44	3.39	74	5.69	713	54.86
	Coffs Harbour	345	4.46	386	5	3997	51.72
	Kempsey	233	7.83	215	7.23	1814	60.99
	Nambucca	76	3.84	102	5.15	969	48.93
	Port Macquarie-Hastings	606	7.17	561	6.64	4057	48
	<i>LHD Total²</i>	1304	5.78	1338	5.93	11550	51.18
Murrumbidgee	Albury	259	4.77	261	4.8	1718	31.61
	Berrigan	29	3.31	32	3.66	310	35.43
	Bland	16	2.68	16	2.68	242	40.52
	Carrathool	4	1.43	4	1.43	58	20.72
	Coolamon	31	7.14	44	10.14	226	52.06
	Cootamundra-Gundagai Regional	67	5.96	76	6.76	473	42.1
	Edward River	43	4.73	56	6.16	366	40.29
	Federation	28	2.25	43	3.46	366	29.43
	Greater Hume Shire	36	3.34	54	5.02	371	34.47
	Griffith	163	6.03	117	4.33	1146	42.4
	Hay	8	2.71	12	4.07	121	41.03
	Hilltops	78	4.17	82	4.38	610	32.61
	Junee	40	5.99	23	3.44	169	25.29
	Lachlan ¹	7	1.15	8	1.32	123	20.25
	Leeton	35	3.06	54	4.72	420	36.7
	Lockhart	12	3.65	10	3.04	165	50.23
	Murray River	6	0.5	1	0.08	24	1.98
	Murrumbidgee	13	3.32	29	7.4	139	35.49
	Narrandera	15	2.54	24	4.07	179	30.34
	Snowy Valleys	79	5.46	108	7.46	597	41.23
	Temora	27	4.28	51	8.09	250	39.64
Wagga Wagga	574	8.8	553	8.47	4425	67.81	
<i>LHD Total²</i>	1566	5.25	1653	5.54	12444	41.74	
Nepean Blue Mountains	Blue Mountains	781	9.87	707	8.94	8224	103.95
	Hawkesbury	518	7.7	389	5.78	5206	77.36
	Lithgow	105	4.86	137	6.34	1379	63.83
	Penrith	1863	8.75	1687	7.92	20944	98.34
	<i>LHD Total²</i>	3250	8.31	2903	7.42	35581	91

Local Health District	Local Government Area	Week ending					
		06 June		30 May		Total	
		No.	Tests per 1,000 population	No.	Tests per 1,000 population	No.	Tests per 1,000 population
Northern NSW	Ballina	343	7.69	414	9.28	3075	68.9
	Byron	222	6.33	203	5.79	2549	72.66
	Clarence Valley	261	5.05	329	6.37	2429	47.02
	Kyogle	33	3.75	40	4.55	288	32.74
	Lismore	340	7.78	349	7.99	2638	60.38
	Richmond Valley	170	7.24	180	7.67	1157	49.31
	Tenterfield	21	3.18	19	2.88	204	30.94
	Tweed	621	6.4	593	6.11	4811	49.6
	<i>LHD Total²</i>	2000	6.44	2113	6.81	17004	54.79
Northern Sydney	Hornsby	811	5.33	753	4.95	8748	57.53
	Hunters Hill	258	17.22	280	18.69	2581	172.3
	Ku-ring-gai	1121	8.82	1091	8.58	10091	79.36
	Lane Cove	708	17.63	720	17.93	6491	161.65
	Mosman	299	9.65	274	8.84	2913	94.03
	North Sydney	507	6.76	547	7.29	5256	70.06
	Northern Beaches	1403	5.13	2024	7.4	21018	76.85
	Parramatta ¹	1150	4.47	1134	4.41	12567	48.86
	Ryde	909	6.92	771	5.87	9512	72.46
	Willoughby	573	7.06	511	6.29	4475	55.12
	<i>LHD Total²</i>	6788	7.1	7182	7.51	73527	76.92
South Eastern Sydney	Bayside	1052	5.9	998	5.59	9836	55.14
	Georges River	839	5.26	821	5.15	8195	51.39
	Randwick	1780	11.44	1762	11.32	15744	101.15
	Sutherland Shire	2529	10.97	2203	9.55	18456	80.03
	Sydney ¹	2103	8.54	2079	8.44	21284	86.4
	Waverley	1187	15.98	1125	15.14	11123	149.71
	Woollahra	801	13.49	784	13.2	8115	136.65
	<i>LHD Total²</i>	8743	9.12	8277	8.63	78298	81.64
South Western Sydney	Camden	962	9.48	792	7.81	8196	80.8
	Campbelltown	1224	7.16	990	5.79	11179	65.4
	Canterbury-Bankstown ¹	2432	6.44	2155	5.7	21506	56.91
	Fairfield	807	3.81	869	4.1	7590	35.85
	Liverpool	1319	5.8	1028	4.52	11854	52.09
	Wingecarribee	378	7.39	385	7.53	4227	82.67
	Wollondilly	269	5.06	260	4.89	2471	46.49
	<i>LHD Total²</i>	6207	5.98	5445	5.24	55947	53.87

Local Health District	Local Government Area	Week ending					
		06 June		30 May		Total	
		No.	Tests per 1,000 population	No.	Tests per 1,000 population	No.	Tests per 1,000 population
Southern NSW	Bega Valley	122	3.54	121	3.51	1406	40.78
	Eurobodalla	246	6.39	242	6.29	2137	55.55
	Goulburn Mulwaree	181	5.81	173	5.56	1932	62.06
	Queanbeyan-Palerang Regional	255	4.17	325	5.32	2755	45.09
	Snowy Monaro Regional	103	4.95	110	5.29	943	45.35
	Upper Lachlan Shire	66	8.19	37	4.59	364	45.17
	Yass Valley	77	4.51	77	4.51	701	41.03
	<i>LHD Total²</i>	1050	4.84	1085	5	10239	47.17
Sydney	Burwood	191	4.7	181	4.46	1755	43.21
	Canada Bay	875	9.11	844	8.78	8576	89.26
	Canterbury-Bankstown ¹	2432	6.44	2155	5.7	21506	56.91
	Inner West	2411	12.01	2160	10.76	19781	98.51
	Strathfield	353	7.52	279	5.95	3078	65.59
	Sydney ¹	2103	8.54	2079	8.44	21284	86.4
	<i>LHD Total²</i>	6536	9.38	5979	8.58	58472	83.92
Western NSW	Bathurst Regional	288	6.6	298	6.83	2651	60.78
	Blayney	50	6.78	54	7.32	537	72.77
	Bogan	15	5.81	11	4.26	91	35.27
	Bourke	8	3.09	3	1.16	32	12.36
	Brewarrina	8	4.97	6	3.72	55	34.14
	Cabonne	66	4.84	102	7.48	465	34.11
	Cobar	9	1.93	14	3.01	105	22.54
	Coonamble	20	5.05	21	5.31	214	54.07
	Cowra	99	7.77	79	6.2	476	37.35
	Dubbo Regional	341	6.35	304	5.66	2195	40.86
	Forbes	30	3.03	15	1.51	183	18.47
	Gilgandra	20	4.72	16	3.77	117	27.6
	Lachlan ¹	7	1.15	8	1.32	123	20.25
	Mid-Western Regional	278	11.01	142	5.62	1137	45.03
	Narromine	35	5.37	27	4.14	189	29
	Oberon	20	3.7	25	4.62	319	58.95
	Orange	390	9.19	419	9.87	3032	71.42
	Parkes	49	3.3	69	4.65	515	34.71
	Walgett	30	5.04	22	3.7	296	49.72
	Warren	17	6.3	25	9.27	163	60.44
Warrumbungle Shire	34	3.66	48	5.17	397	42.79	
Weddin	27	7.47	22	6.09	128	35.43	
<i>LHD Total²</i>	1840	6.46	1728	6.06	13361	46.88	

Local Health District	Local Government Area	Week ending					
		06 June		30 May		Total	
		No.	Tests per 1,000 population	No.	Tests per 1,000 population	No.	Tests per 1,000 population
Western Sydney	Blacktown	2048	5.47	1841	4.92	23308	62.25
	Cumberland	1366	5.66	1171	4.85	12522	51.85
	Parramatta ¹	1150	4.47	1134	4.41	12567	48.86
	The Hills Shire	1010	5.68	1083	6.09	12422	69.8
	<i>LHD Total²</i>	5418	5.14	5049	4.79	58802	55.82
NSW Total³		61,993	7.66	58,352	7.21	574,867	71.1

¹Local Government Area (LGA) spans multiple Local Health Districts.

²Local Health District total counts and rates includes tests for LHD residents only. Murrumbidgee includes Albury LGA residents.

³NSW Total counts and rates include tests where residential information is incomplete.

See <https://www.health.nsw.gov.au/Infectious/covid-19/Pages/counting-tests.aspx> for detail on how tests are counted.

APPENDIX B: NUMBER OF POSITIVE PCR TEST RESULTS FOR INFLUENZA AND OTHER RESPIRATORY VIRUSES AT SENTINEL NSW LABORATORIES, 1 JANUARY TO 31 MAY 2020

The reported testing numbers reflect the number of influenza PCR tests conducted, not all samples are tested for all of the other respiratory viruses. Therefore data presented may tend to under-represent current respiratory virus activity in NSW.

Specimen collection date	Total PCR tests conducted	Influenza A	Influenza B	Adenovirus	Para-influenza	RSV	Rhinovirus	HMPV	Enterovirus
1 Jan — 31 May 2020									
Count	280,203	6,435	919	2,892	8,248	4,153	35,716	1,713	3,000
% Positive		2.3%	0.3%	1.0%	2.9%	1.5%	12.7%	0.6%	1.1%
Month ending									
3/02/2020*	34,953	2,508	394	846	1,900	752	5,036	593	335
1/03/2020	40,272	2,352	315	796	2,421	1,112	8,190	431	999
29/03/2020	80,234	1,475	192	853	3,636	1,844	16,876	617	1,355
3/05/2020*	53,426	67	13	166	233	356	2,152	45	204
31/05/2020	71,318	33	5	231	58	89	3,462	27	107
Week ending									
10/05/2020	17,628	10	1	26	10	34	362	7	28
17/05/2020	19,085	10	1	49	25	27	508	5	28
24/05/2020	16,649	9	1	69	8	14	809	7	22
31/05/2020	17,956	4	2	87	15	14	1,783	8	29

Notes:

Preliminary laboratory data is provided by participating sentinel laboratories on a weekly basis and are subject to change. Serological diagnoses are not included.

HMPV - Human metapneumovirus

RSV - Respiratory syncytial virus

*Five-week period