

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.

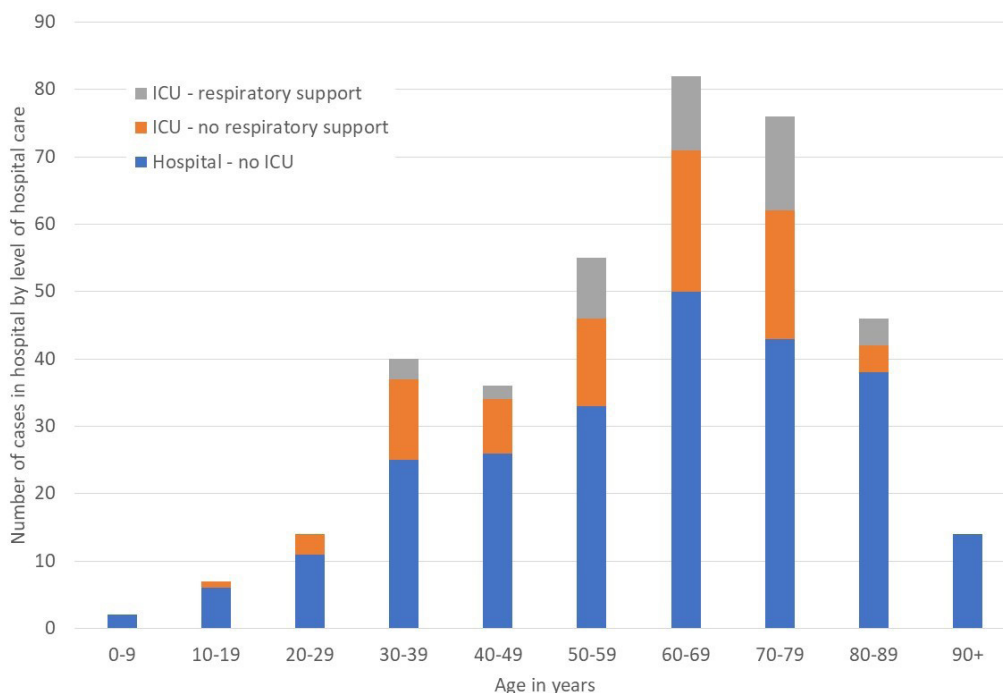
Hospital admissions for COVID-19 cases from the NSW Admitted Patient Data Collection (APDC) and the Notifiable Conditions Information Management System (NCIMS) were linked. The APDC includes data reported from all public hospitals in NSW (excluding the Northern Beaches Hospital) and includes information 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%

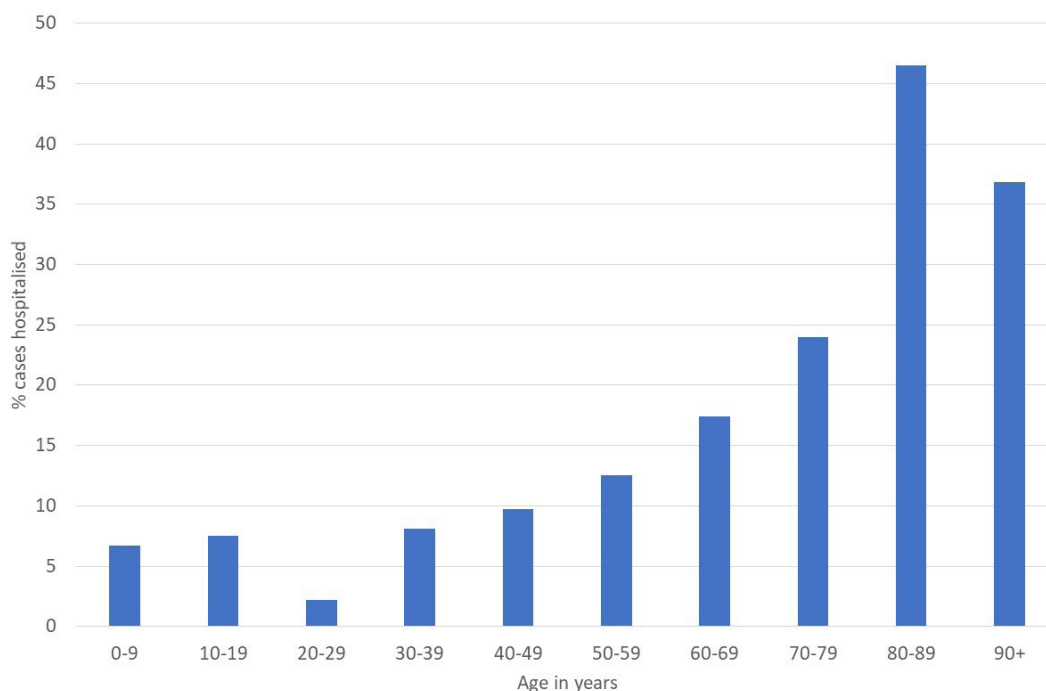
* 71% (n=267) of all hospitalised cases had diagnostic codes available in their hospital records and the proportion is calculated using this number as the denominator.

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



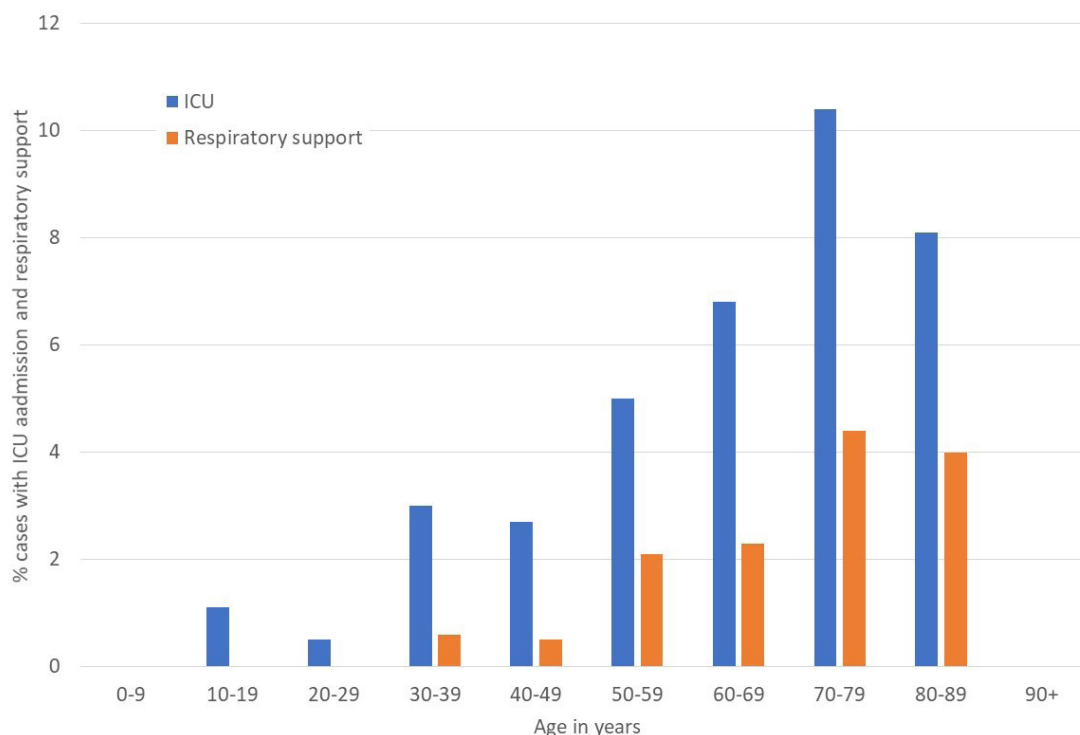
Interpretation: Overall, 12.4% (372/2988) of people diagnosed with COVID-19 in NSW have been hospitalised in NSW. The percentage of people with COVID-19 hospitalised differs substantially by age with the highest percentage among 80-89 year olds (46.5%) and the lowest in 20-29 year olds (2.2%). Among 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.

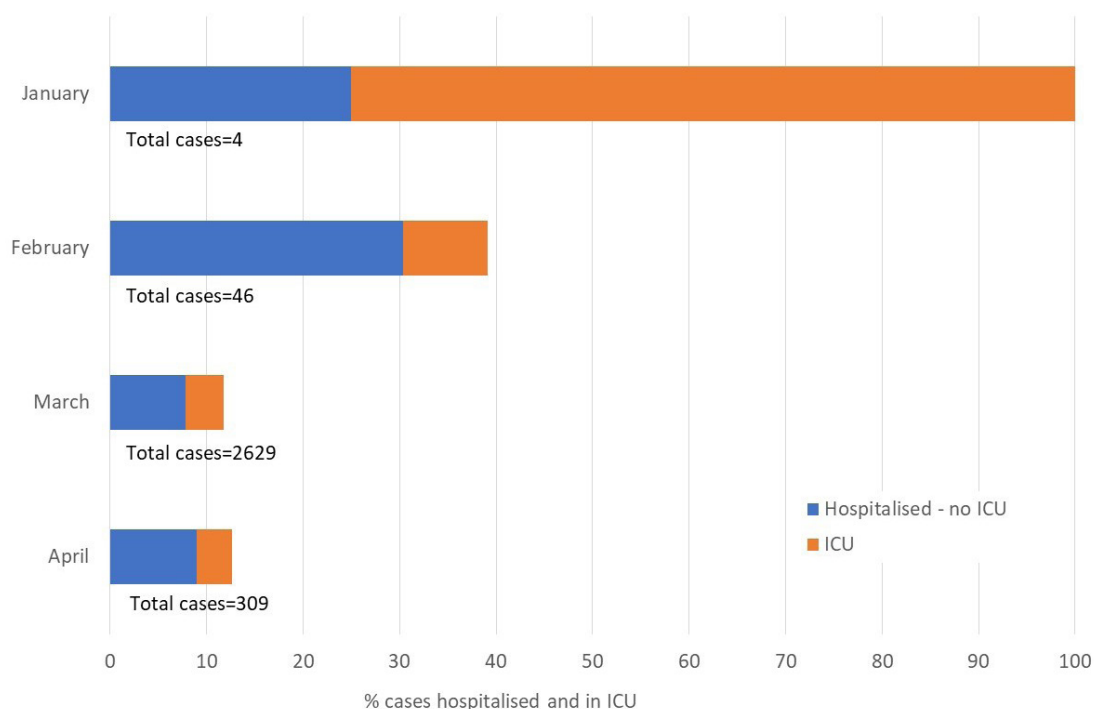
People needing respiratory support in an ICU is an indication of severe illness. The absence of people aged 90+ years admitted to ICU and on respiratory support may indicate a preference, and a desire expressed through Advanced Care Directives, for less aggressive management in the most elderly cases.

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.

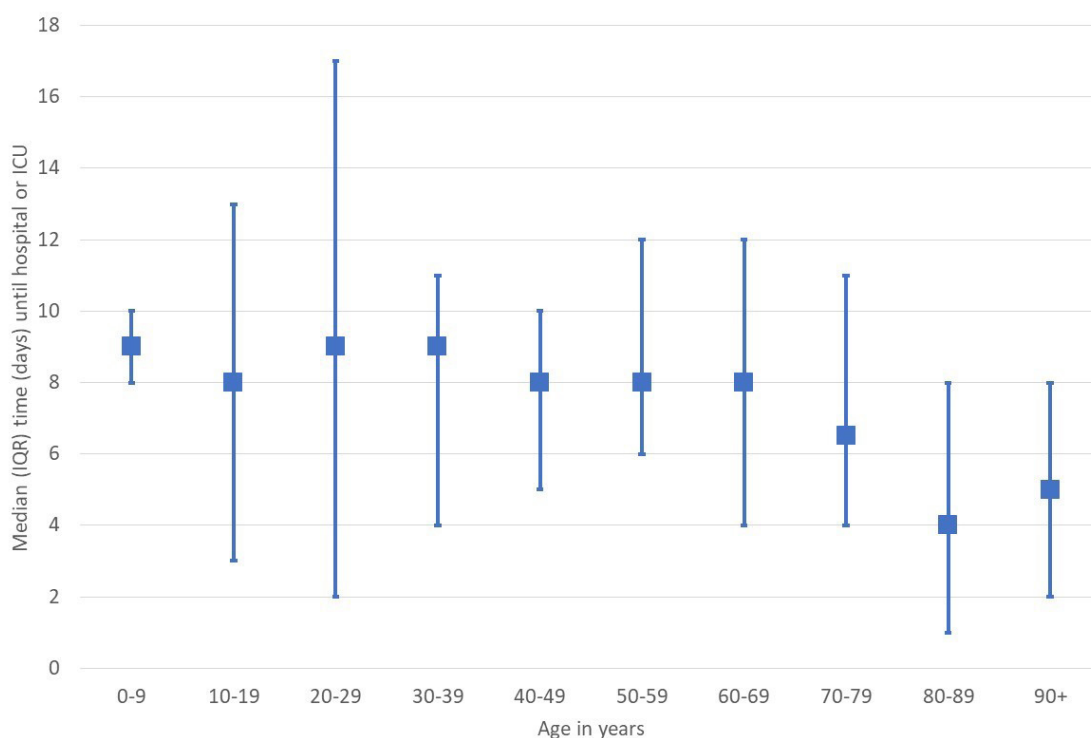
To account for the more precautionary approach to management and isolation of cases in January and February, we examined the 2,938 COVID-19 cases diagnosed from 1 March to 19 April 2020. The total percentage of cases hospitalised and admitted to ICU was similar to that estimated for all cases (i.e. 11.9% 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.

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

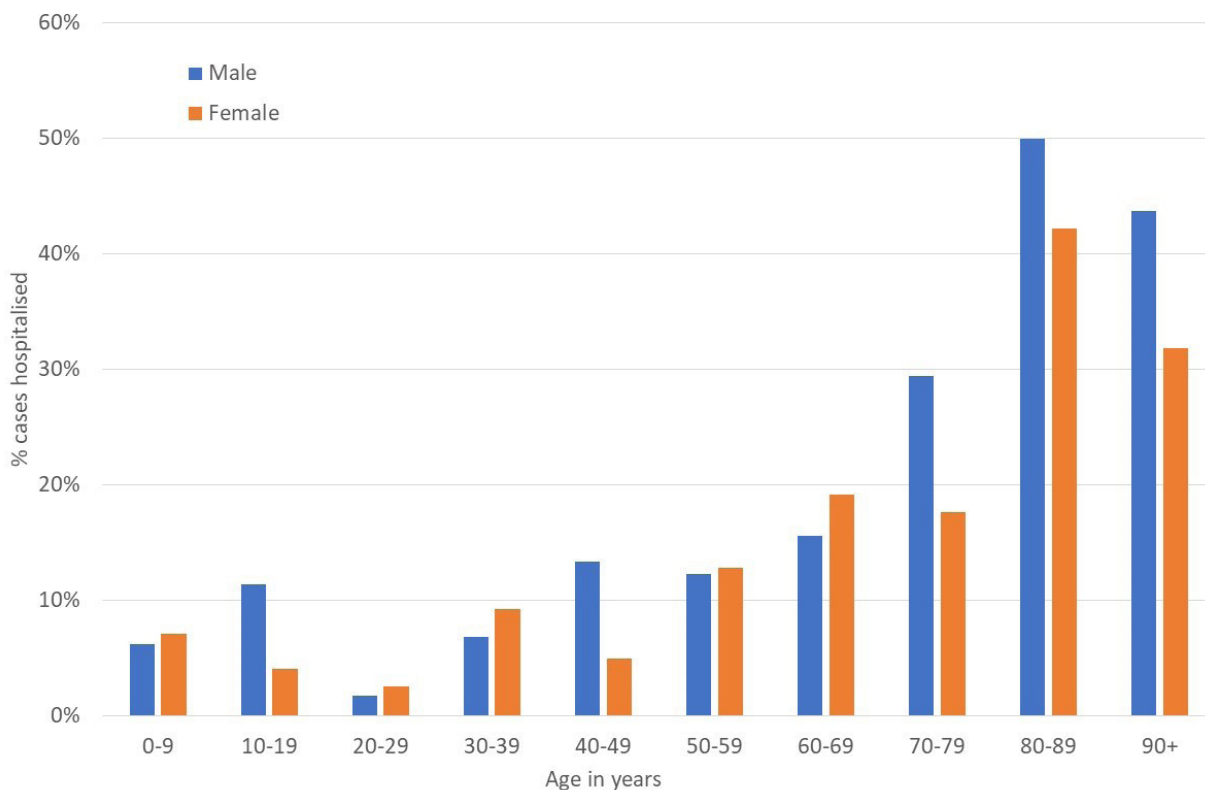


Interpretation: For cases diagnosed between 1 March and 19 April, the median time from onset of illness to first hospitalisation was 7 days, and to first ICU admission was 9 days. Among adults, the median time to hospitalisation appeared to decrease in the oldest age groups. The median time to hospitalisation 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?

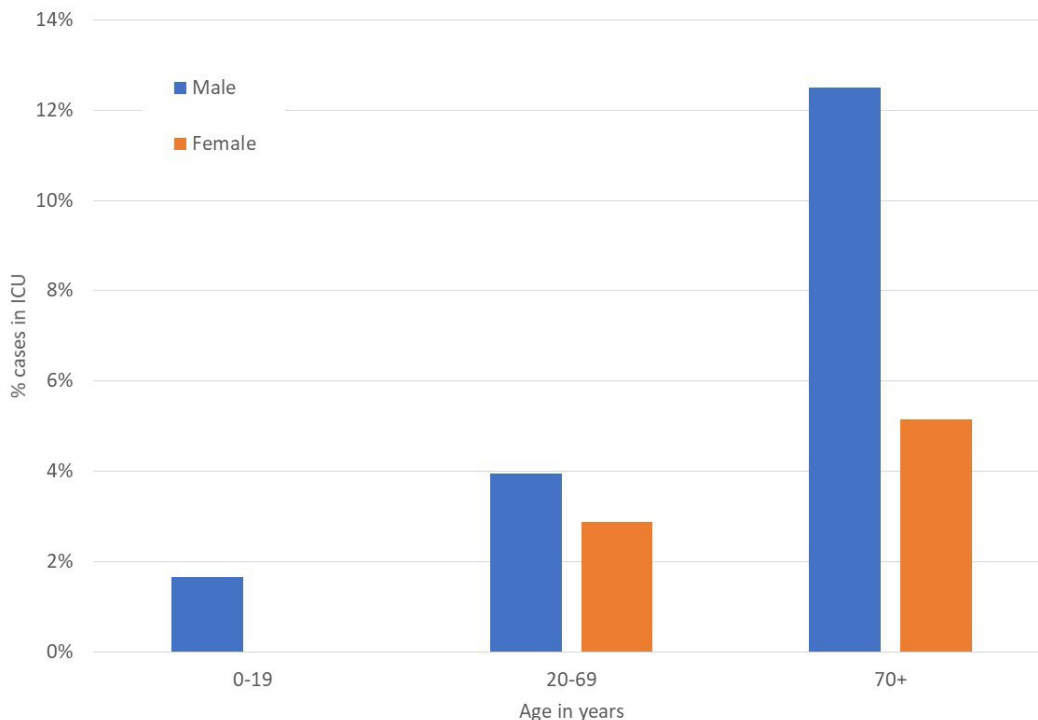
It has been reported that there are differences in the severity of COVID-19 between men and women.

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.