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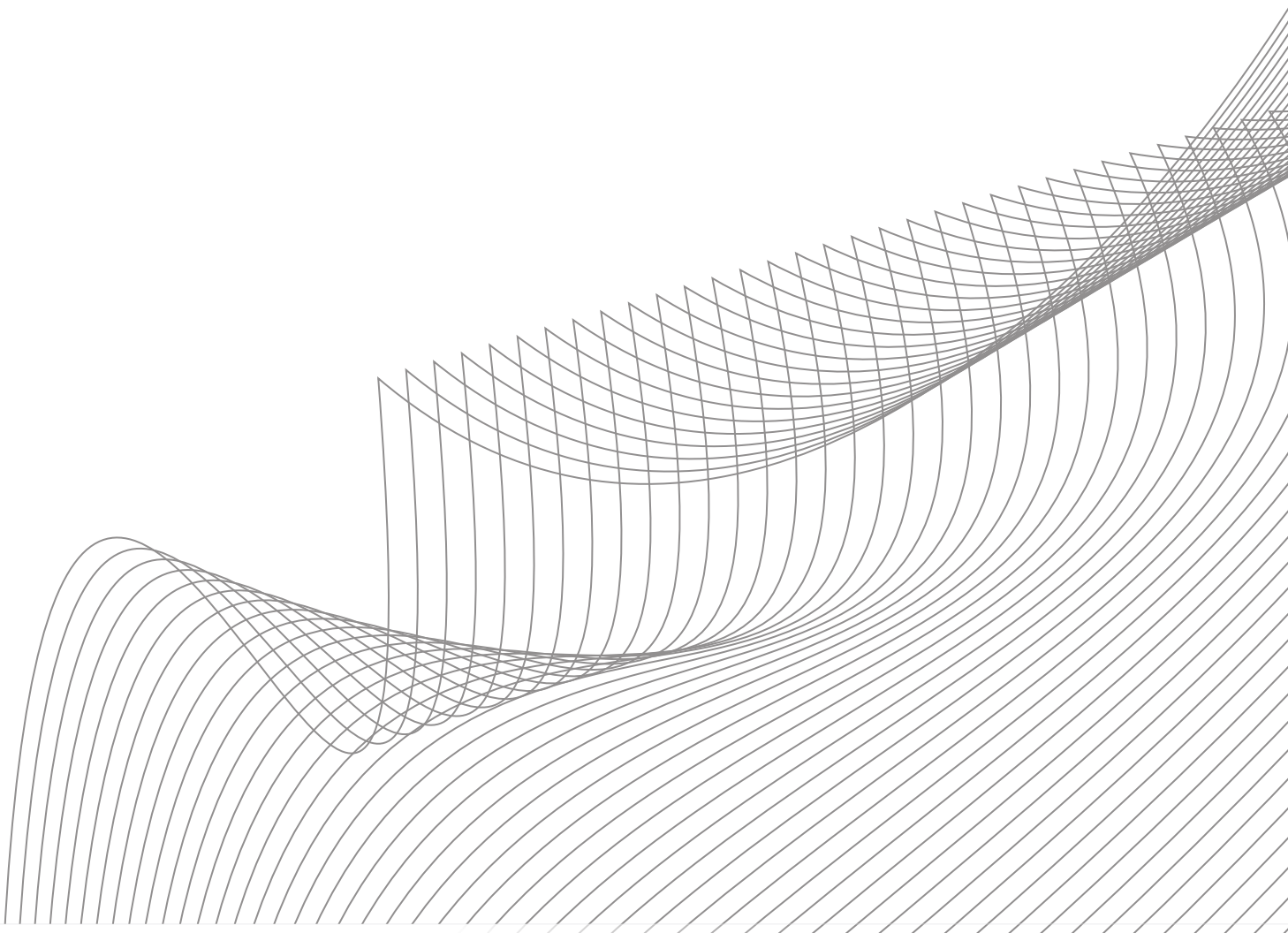
COVID-19 Australia: Epidemiology Report 79

Reporting period ending 24 September 2023

COVID-19 Epidemiology and Surveillance Team



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Surveillance summary

COVID-19 Australia: Epidemiology Report 79

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COVID-19 Epidemiology and Surveillance Team

Summary

Four-week reporting period (28 August – 24 September 2023)

Case definitions for confirmed and probable cases are in accordance with the coronavirus disease 2019 (COVID-19) Series of National Guidelines for Public Health Units (SoNG).

Trends – Nationally, case notifications have stabilised since the end of the fifth Omicron wave in mid-August 2023. In the four-week period 28 August – 24 September 2023, there were 10,484 confirmed and 10,095 probable cases, a total of 20,579 COVID-19 cases reported in Australia to the National Notifiable Diseases Surveillance System (NNDSS). In the most recent reporting fortnight, a total of 10,576 confirmed and probable cases were notified (an average of 755 cases per day), compared to 10,003 in the previous fortnight.

Age group – Overall, notification rates among most age groups have stabilised following the end of the fifth Omicron wave in mid-August 2023. In the current reporting period, 28 August – 24 September 2023, the highest notification rate was observed among adults aged 90 years and over, whilst the lowest rates were among young people and children aged 19 years or less. For the entire Omicron wave to date (15 December 2021 – 24 September 2023), the highest notification rate has been in adults aged 20 to 29 years.

Aboriginal and Torres Strait Islander people – In the reporting period 28 August – 24 September 2023, there were 537 new cases notified in Aboriginal and Torres Strait Islander people, accounting for 2.6% of all cases (537/20,579) during this time. In the overall Omicron wave to date (15 December 2021 – 24 September 2023), there have been 421,696 cases notified among Aboriginal and Torres Strait Islander people, representing 3.7% of all cases (421,696/11,382,841) during this period.

Severity – During the fifth Omicron wave, the number of cases with severe illness (defined as those admitted to ICU or died) peaked at 340 severe cases per week (in the week ending 28 May 2023); this was lower than the number of cases with severe illness observed in previous Omicron waves. The overall crude case fatality rate from the start of the Omicron wave to date is 0.18%, which is lower than the crude rate during the Delta wave (0.71%).

Virology – For samples collected in the four-week period 28 August – 24 September 2023, all sequences uploaded to AusTrakka were assigned against Omicron or recombinants consisting of Omicron lineages. This represents an 84% increase in the number of sequences compared to the previous reporting period. In this reporting period, of the 462 sequences uploaded to AusTrakka during 28 August – 24 September 2023, most (94.6%) were recombinant or recombinant sub-lineages; 5.2% were BA.2.75 sub-sub lineages; and one sequence (0.2%) belonged to a BA.5 sub-lineage.

Acute respiratory illness – Based on self-reported FluTracking data, there has been an overall increase in the incidence of respiratory illness, 'fever and cough' and 'runny nose and sore throat' symptoms, in the community since late January 2023. Over the current period, the proportion of 'fever and cough' has decreased to a weekly average of 1.5% and is slightly higher than the proportion observed during the same period in 2022. The proportion of 'runny nose and sore throat' has increased since late July 2023 to a weekly average of 1.3%, with proportions of this symptom profile now slightly lower than the proportion observed in 2022 for the same period.

International situation – According to the World Health Organization (WHO), as of 24 September 2023, over 770 million COVID-19 cases and over 6.9 million deaths have been reported globally since the start of the pandemic, with a global case fatality rate (CFR) of approximately 0.90%. At the global level, the number of newly reported cases and deaths in the four-week period to 24 September 2023 decreased by 55% and 34%, respectively.

Keywords: SARS-CoV-2; novel coronavirus; coronavirus disease 2019; COVID-19; acute respiratory disease; epidemiology; Australia

This reporting period covers the four-week period 28 August – 24 September 2023. Within this period, data for each week is compared. The previous reporting period was the preceding four weeks (31 July – 27 August 2023).[1] The focus of this report is on the epidemiological situation in Australia since the beginning of the Omicron wave. For the purposes of this report, 15 December 2021 is used as a proxy for the beginning of this wave. This date was chosen as from this date onward, most sequenced strains from cases were Omicron. Readers are encouraged to consult prior reports in this series for information on the epidemiology of coronavirus disease 2019 (COVID-19) in Australia.

Methods of data analysis in these reports have periodically changed over the course of this reporting series to date. Please refer to the Technical Supplement for details of such changes, and for definitions of terminology.[2]

From Report #72 onward, and unless specified otherwise, all data from the National Notifiable Diseases Surveillance System (NNDSS) have been extracted using 'diagnosis date' rather than 'notification received date' (see the Technical Supplement for definitions). Due to COVID-19 reporting changes in several states and territories, the use of 'diagnosis date' now provides a more consistent and accurate method for describing transmission trends in Australia.

The case data provided includes both confirmed cases and probable cases reported to the NNDSS, as defined in accordance with the COVID-19 series of national guidelines (SoNG).[3] For the purposes of this report, only probable cases from 5 January 2022 are included. Since 1 July and 1 September 2023, Victoria and Queensland, respectively, have ceased collecting and reporting data on probable COVID-19 cases.

From Report #71 onward, population data for Aboriginal and Torres Strait Islander people was updated (from 2016) and is now based on Australian Bureau of Statistics (ABS) Estimated Resident Population (ERP) as at 2021. There has been an increase of 185,600 Aboriginal and Torres Strait Islander people (23.2%) since the previous ERP (June 2016). Therefore, notification rate comparisons with reports prior to #71 should be undertaken with caution.

Due to the dynamic nature of data in the NNDSS, numbers may be subject to revision

and may vary from numbers previously reported and from case notifications released by states and territories.

Background and data sources

See the Technical Supplement for general information on COVID-19 including modes of transmission, common symptoms, and severity.[2]

Activity

COVID-19 trends
(NNDSS)

Since the beginning of the pandemic to 24 September 2023, jurisdictions in Australia have reported 11,626,278 COVID-19 cases to the NNDSS. Nationally, case notifications have stabilised since the end of the fifth Omicron wave in mid-August 2023 (Figure 1).

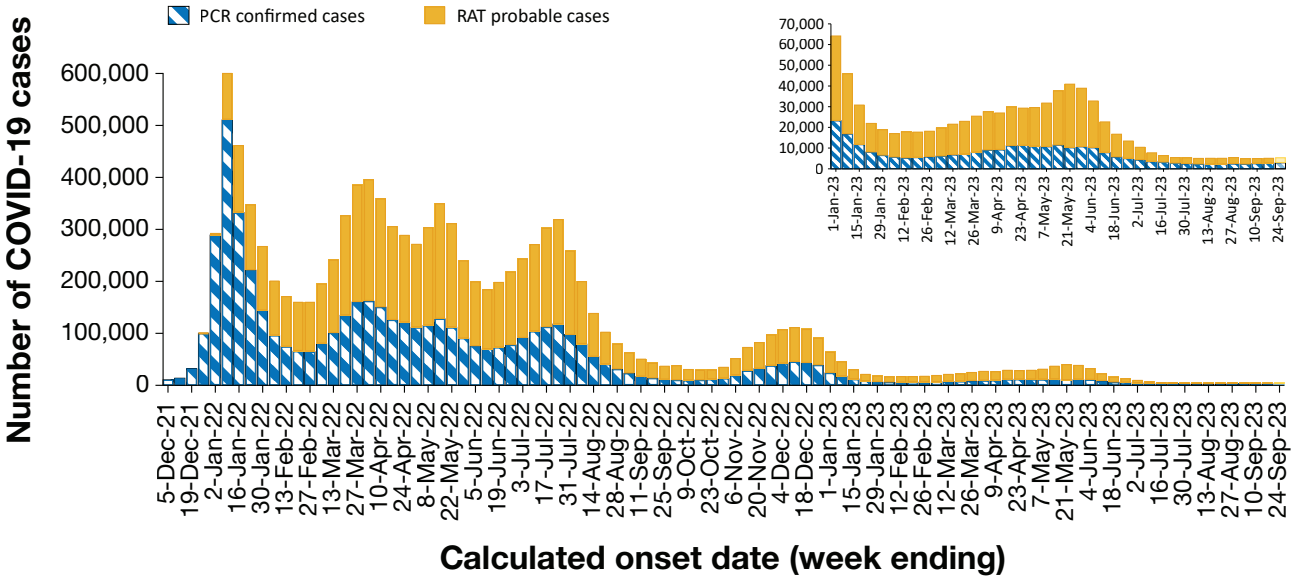
In the four-week period 28 August – 24 September 2023, there were 10,484 confirmed and 10,095 probable cases of COVID-19 reported in Australia to the NNDSS (Table 1).

In the most recent reporting fortnight, a total of 10,576 confirmed and probable cases were notified (an average of 755 cases per day), compared to 10,003 in the previous fortnight (an average of 715 cases per day).

As the pandemic has progressed, the proportion of cases reported through surveillance mechanisms has decreased and there are many different sub-lineages of virus circulating simultaneously. Additionally, increases in other measures of disease activity, such as the numbers of people admitted to hospital, intensive care units (ICU) or having died, often lag weeks behind increases in infections in the community. This has made defining the start of a new wave more complex, with the determination often now only possible several weeks after the wave has commenced.

Since the emergence of the Omicron variant in Australia, there have been five distinct waves of transmission, defined by the predominant Omicron subvariant circulating (Figure 1). The first wave, of the BA.1 subvariant, occurred from mid-December 2021 to February 2022, with a peak in cases observed in early January 2022.

Figure 1: Confirmed and probable weekly COVID-19 notified cases by date of onset, Australia, 29 November 2021 – 24 September 2023[a,b,c]



a Source: NNDSS extract from 11 October 2023 for cases with an illness onset from 29 November 2021 to 24 September 2023.

b Inset graph displays trends from 26 December 2022 to 24 September 2023.

c Since 1 July and 1 September 2023, Victoria and Queensland, respectively, have ceased collecting and reporting data on probable COVID-19 cases.

Table 1: Confirmed and probable COVID-19 cases by jurisdiction and date of illness onset, Australia, 15 December 2021 – 24 September 2023[a,b,c]

Jurisdiction	Reporting period						Current Omicron wave		
	28 August – 10 September 2023			11–24 September 2023			15 December 2021 – 24 September 2023		
	Confirmed	Probable	Total	Confirmed	Probable	Total	Confirmed	Probable	Total
ACT	88 (25.8%)	253 (74.2%)	341	107 (30.8%)	240 (69.2%)	347	133,003 (54.4%)	111,479 (45.6%)	244,482
NSW	1,727 (44.4%)	2,161 (55.6%)	3,888	2,071 (47.3%)	2,306 (52.7%)	4,377	2,152,616 (56.1%)	1,681,861 (43.9%)	3,834,477
NT	52 (43.3%)	68 (56.7%)	120	96 (55.5%)	77 (44.5%)	173	24,848 (22.8%)	83,971 (77.2%)	108,819
Qld [d]	877 (75.1%)	291 (24.9%)	1,168	877 (96.0%)	37 (4.0%)	914	697,402 (40.2%)	1,039,395 (59.8%)	1,736,797
SA	454 (35.3%)	831 (64.7%)	1,285	541 (36.4%)	945 (63.6%)	1,486	529,876 (56.5%)	408,293 (43.5%)	938,169
Tas.	113 (17.3%)	539 (82.7%)	652	68 (12.7%)	469 (87.3%)	537	66,990 (22.0%)	238,138 (78.0%)	305,128
Vic.[d]	1,173 (99.0%)	12 (1.0%)	1,185	1,622 (99.6%)	6 (0.4%)	1,628	1,100,568 (38.8%)	1,737,631 (61.2%)	2,838,199
WA	332 (24.3%)	1,032 (75.7%)	1,364	286 (25.7%)	828 (74.3%)	1,114	503,002 (36.5%)	873,768 (63.5%)	1,376,770
Australia	**4,816 (48.1%)**	**5,187 (51.9%)**	**10,003**	**5,668 (53.6%)**	**4,908 (46.4%)**	**10,576**	**5,208,305 (45.8%)**	**6,174,536 (54.2%)**	**11,382,841**

a Source: NNDSS extract from 11 October 2023 for cases with an illness onset from 15 December 2021 to 24 September 2023.

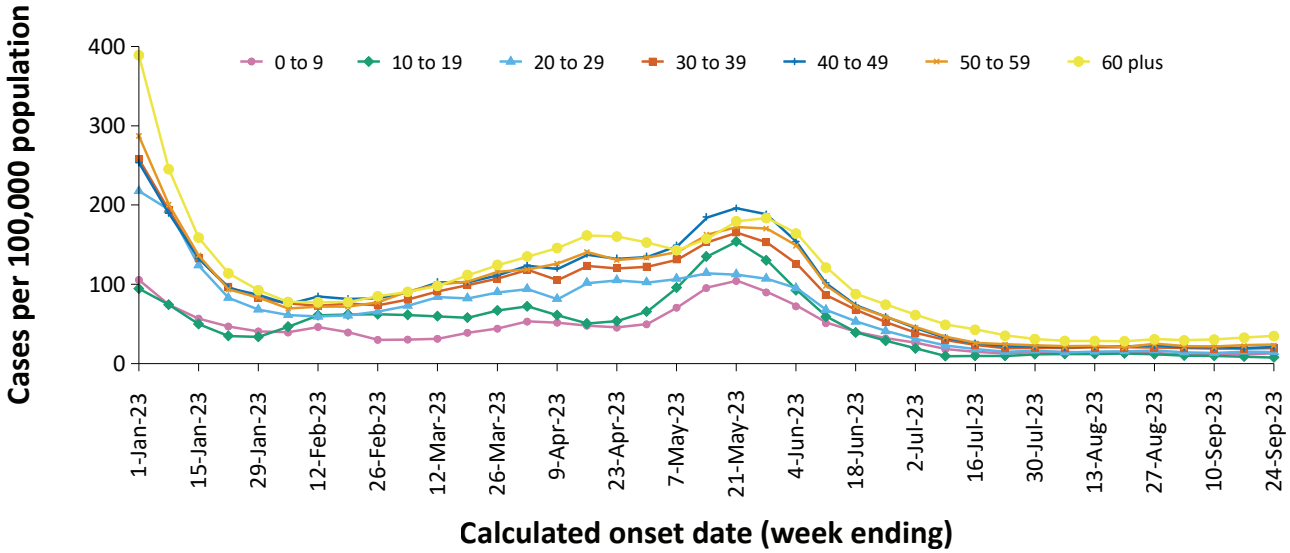
b ACT: Australian Capital Territory; NSW: New South Wales; NT: Northern Territory; Qld: Queensland; SA: South Australia; Tas.: Tasmania; Vic.: Victoria; WA: Western Australia.

c Since 1 July 2023, cases are classified based on jurisdiction of residence. This does not necessarily reflect the place where the disease was acquired or where the case presented. Please note prior to this, cases were classified based on the jurisdiction in which they tested positive.

d Since 1 July 2023 and 1 September 2023, Victoria and Queensland, respectively, have ceased collecting and reporting data on probable COVID-19 cases.

From March 2022, the BA.2 subvariant was the predominant strain; in this second Omicron wave, there was a primary peak in early April and a secondary peak in late May 2022. In early July 2022, BA.5 (including sub-lineages) became the predominant subvariant detected in Australia, driving a third wave of transmission which peaked in the week ending 24 July 2022. A fourth wave of transmission commenced in late October 2022, driven by a combination of existing and newly emerging Omicron subvariants. This wave peaked during the week ending 11 December 2022. A fifth Omicron wave of transmission, similarly driven by a combination of existing and newly emerging recombinant Omicron subvariants, was signalled by an increasing trend in hospitalisations from mid-March 2023, leading to a peak in notifications in the week ending 21 May 2023 (Figure 1). Since this time, several measures including case notifications and severity indicators have stabilised, signalling the end of the fifth Omicron wave in mid-August 2023.

Figure 2: Confirmed and probable COVID-19 notification weekly rates for ten-year age groups by date of onset, Australia, 26 December 2022 – 24 September 2023[a,b]



a Source: NNDSS extract from 11 October 2023 for cases with an illness onset from 26 December 2022 to 24 September 2023.

b Population data based on Australian Bureau of Statistics (ABS) Estimated Resident Population (ERP) as at June 2022.

Due to a reduction in case ascertainment in all jurisdictions, including changes in testing and reporting requirements, reported case numbers underestimate disease incidence in the community.

Demographic features

(NNDSS)

Overall, notification rates among most age groups have stabilised following the end of the fifth Omicron wave in mid-August 2023 (Figure 2). The highest notification rates were in adults aged 60 years and over (Figure 2). In the current reporting period, 28 August – 24 September 2023, the highest notification rate was observed among adults aged 90 years and over, whilst the lowest rates were among young people and children aged 19 years or less (Appendix A, Table A.1). For the entire Omicron wave to date (15 December 2021 – 24 September 2023), the highest notification rate has been in adults aged 20 to 29 years (Appendix A, Table A.1). For this age group, the weekly notification rate peaked in the week ending 9 January 2022 at approximately 5,800 cases per 100,000 population (data not shown).

Aboriginal and Torres Strait Islander persons

(NNDSS)

Overall, since the start of the pandemic, Aboriginal and Torres Strait Islander status is unknown for approximately 13.1% of COVID-19 notifications in NNDSS. Therefore, the number of cases classified as Aboriginal and Torres Strait Islander people is likely an underrepresentation. During the reporting period, there were 537 new cases notified among Aboriginal and Torres Strait Islander people (Table 2). In the Omicron wave to date (15 December 2021 – 24 September 2023), notifications among Aboriginal and Torres Strait Islander people have comprised 3.7% of all cases (421,696/11,382,841).

Table 2: Confirmed and probable cases of COVID-19 among Aboriginal and Torres Strait Islander peoples by jurisdiction and date of onset, Australia, 1 January 2020 – 24 September 2023[a,b,c]

Jurisdiction [b]	Reporting period 28 August – 24 September 2023	Omicron to date 15 December 2021 – 24 September 2023	Delta 16 June – 14 December 2021	Pandemic to date 1 January 2020 – 24 September 2023
ACT	3	4,290	240	4,534
NSW	233	139,074	7,726	146,871
NT	62	26,592	94	26,687
Qld	90	112,522	19	112,564
SA	25	24,052	3	24,060
Tas.	50	17,359	1	17,372
Vic.	7	36,366	1,938	38,400
WA	67	61,441	–	61,443
Australia	**537**	**421,696**	**10,021**	**431,931**

a Source: NNDSS extract from 11 October 2023 for cases with an illness onset from 1 January 2020 to 24 September 2023.

b ACT: Australian Capital Territory; NSW: New South Wales; NT: Northern Territory; Qld: Queensland; SA: South Australia; Tas: Tasmania; Vic: Victoria; WA: Western Australia.

c Since 1 July 2023, cases are classified based on jurisdiction of residence. This does not necessarily reflect the place where the disease was acquired or where the case presented. Please note that, prior to this, cases were classified based on the jurisdiction in which they tested positive.

Table 3: COVID-19 cases among Aboriginal and Torres Strait Islander people by area of remoteness, Australia, 15 December 2021 – 24 September 2023 [a]

Jurisdiction [b,c]	Major city	Inner regional	Outer regional	Remote [d]
ACT	4,241	35	12	1
NSW	74,626	45,021	15,510	3,146
NT	74	20	8,327	17,264
Qld	43,883	25,917	31,151	11,421
SA	13,038	2,581	5,023	3,254
Tas.	206	10,610	6,099	298
Vic.	20,726	11,727	3,856	19
WA	32,156	4,456	7,691	16,483
Australia	**188,950**	**100,367**	**77,669**	**51,886**

a Source: NNDSS extract from 11 October 2023 for cases with an illness onset from 15 December 2021 to 24 September 2023. Excludes cases with an overseas place of residence, and where place of residence is unknown.

b ACT: Australian Capital Territory; NSW: New South Wales; NT: Northern Territory; Qld: Queensland; SA: South Australia; Tas.: Tasmania; Vic.: Victoria; WA: Western Australia.

c Since 1 July 2023, cases are classified based on jurisdiction of residence. This does not necessarily reflect the place where the disease was acquired or where the case presented. Please note that, prior to this, cases were classified based on the jurisdiction in which they tested positive.

d 'Remote' here also includes areas classified as 'very remote'.

Table 4: Age-specific rates of COVID-19 cases by highest level of illness severity (admitted to ICU and/or died) in Aboriginal and Torres Strait Islander people, Australia, 1 January 2020 to 24 September 2023[a]

Age group (years)	14 August – 24 September 2023	Fifth Omicron wave 1 March – 13 August 2023	Fourth Omicron wave 24 October 2022 – 28 February 2023	Omicron wave to date 15 December 2021 – 24 September 2023	Pandemic to date 1 January 2020 – 24 September 2023
0–9	–	0.9	5.1	21.9	22.8
10–19	–	2.9	1.9	20.3	25.1
20–29	–	3.0	3.0	43.5	52.6
30–39	–	3.2	10.5	52.4	67.7
40–49	–	7.1	10.1	100.8	123.0
50–59	2.3	29.6	30.8	206.2	241.5
60 +	–	80.4	86.3	526.9	571.2
All	**0.2**	**12.1**	**14.6**	**97.5**	**111.4**

a Rate per 100,000 population for the given time period. Aboriginal and Torres Strait Islander population data is based on the Australian Bureau of Statistics (ABS) Estimated Resident Population (ERP) as at 2021.

Of the COVID-19 cases notified among Aboriginal and Torres Strait Islander people from 15 December 2021 to date, and where location of residence was known, 54.9% (229,922/ 418,872) lived in a regional or remote area (Table 3). Most cases reported in outer regional and remote areas since the start of the Omicron wave were diagnosed by rapid antigen test (RAT), at 71.4% (55,442/77,669) and 72.3% (37,504/51,886), respectively. It should be noted that the reliance on RATs for diagnosing COVID-19 is greater in regional and remote areas than in major cities, resulting in a larger under-representation of cases in regional and remote areas than in major cities, due to the changes in reporting requirements of positive RATs.

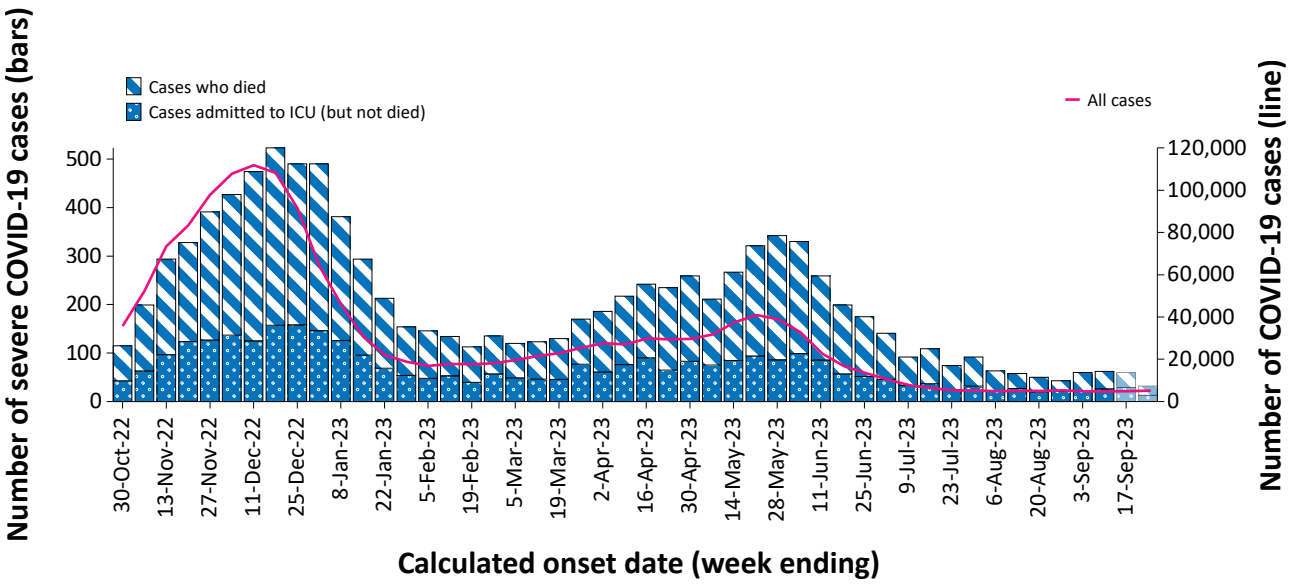
Nationally, there have been 429 COVID-19 associated deaths reported in Aboriginal and Torres Strait Islander people from the start of the pandemic to 24 September 2023. This comprises 141 from New South Wales; 128 from Queensland; 58 from the Northern Territory; 57 from Western Australia; 25 from South Australia; 16 from Victoria; and two each from the Australian Capital Territory and Tasmania. Additionally, 741 Aboriginal and Torres Strait Islander cases have been admitted to ICUs nationally. The overall population rate of severe COVID-19 cases (measured as those who were admitted to ICU or died) in Aboriginal and Torres Strait Islander people during the fifth Omicron wave (12.1 per 100,000 population) was lower than the rate observed during the fourth Omicron wave (14.6 per 100,000 population; Table 4). It should be noted that ICU status in NNDSS is likely incomplete.

Severity

(NNDSS, FluCAN, SPRINT-SARI)

Given the delay between illness onset and severe illness, and to provide a more accurate assessment of severity, cases with an onset in the last two weeks of the reporting period have been excluded from analyses on severe illness (defined as cases admitted to ICU and/or died) and on the proportion of cases admitted to ICU or died.

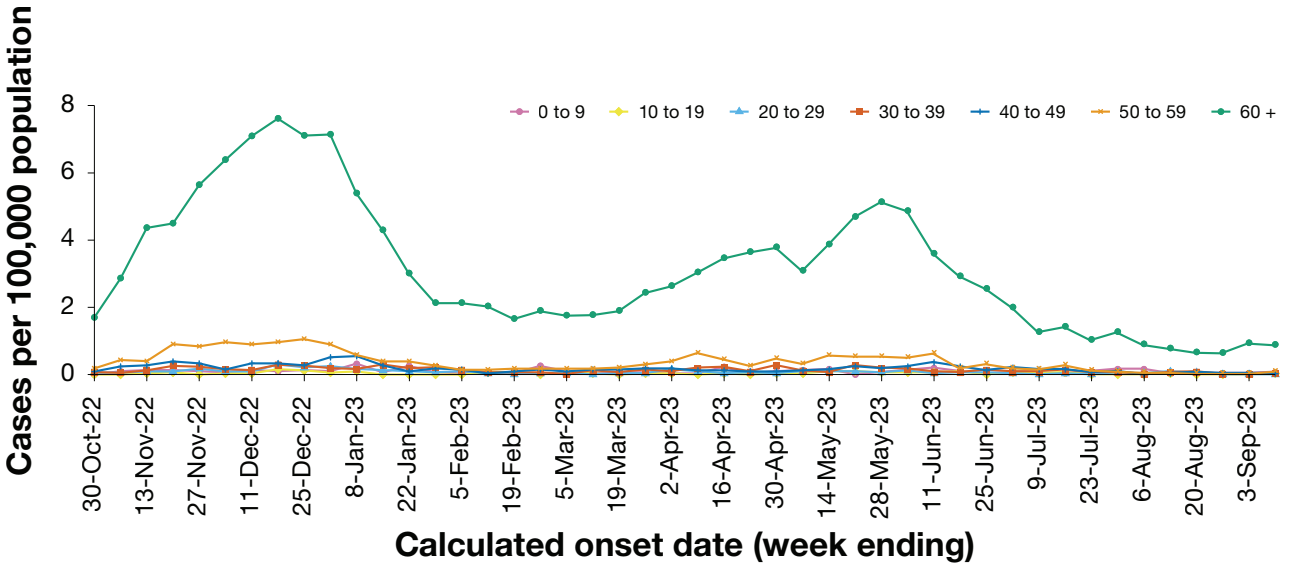
Figure 3: COVID-19 cases, deaths and ICU admissions, Australia, by date of onset, Australia, 24 October 2022 – 24 September 2023[a,b]



a Source: NNDSS extract from 11 October 2023 for cases with an illness onset from 24 October 2022 to 24 September 2023.

b The shaded bars at the right represent the most recent two reporting weeks and should be interpreted with caution, as cases with an illness onset in these weeks may not have yet developed severe disease.

Figure 4: Age-specific weekly rates of COVID-19 cases admitted to ICU or died, by date of onset, Australia, 24 October 2022 to 10 September 2023[a,b]



a Source: NNDSS extract from 11 October 2023 for cases with an illness onset from 24 October 2022 to 10 September 2023; cases with an illness onset in the last two weeks (11–24 September 2023) were excluded to account for the delay between onset and development of severe illness.

b Population data based on Australian Bureau of Statistics (ABS) Estimated Resident Population (ERP) as at June 2022.

Following the emergence of the Omicron variant, the number of cases with severe illness peaked in mid-January 2022, at over 1,250 severe cases per week (data not shown). Since this time there have been subsequent smaller peaks in severe illness, in the week ending 24 July 2022 at over 920 severe cases per week (data not shown) and in the week ending 18 December 2022 at close to 520 severe cases per week. During the fifth Omicron wave, the number of cases with severe illness increased to approximately 340 severe cases per week in the week ending 28 May 2023, followed by a gradual decrease (Figure 3).

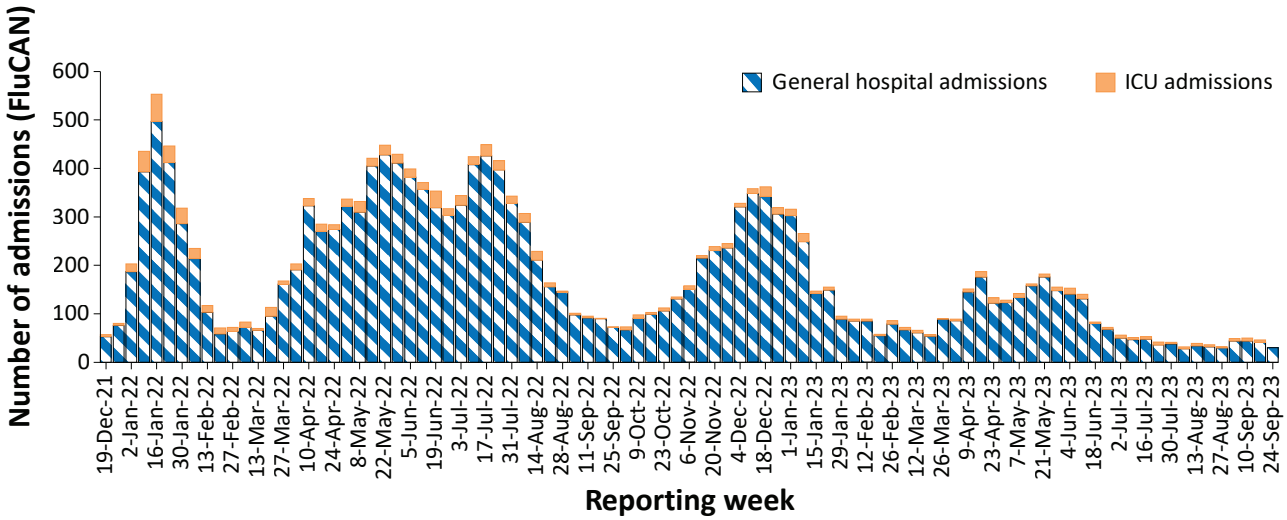
Rates of severe illness were highest in older age groups, particularly those aged 60 years and older (Figure 4). Among this age group, there have been three notable peaks in severe illness since the emergence of Omicron: in the week ending 16 January 2022 (17.5 cases per 100,000 population; data not shown), in the week ending 24 July 2022 (13.7 cases per 100,000 population; data not shown) and in the week ending 18 December 2022 (7.6 cases per 100,000 population). Throughout the fifth Omicron wave (1 March – 13 August 2023), the highest rate of severe illness among those aged 60 years and older was observed in the week ending 28 May 2023 at 5.1 cases per 100,000 population. In comparison, rates of severe illness in younger age groups have remained relatively low and stable throughout earlier Omicron waves, not surpassing 1.2 cases per 100,000 population per week since the start of the fourth Omicron wave (Figure 4).

Hospitalisation and ICU admissions

Influenza Complications Alert Network—FluCAN

Between 15 December 2021 and 24 September 2023, there were 17,391 hospital admissions with confirmed COVID-19 reported at Influenza Complications Alert Network (FluCAN) sentinel sites, including 5.6% (981/17,391) admitted directly to ICU (Figure 5). During the four-week reporting period (28 August – 24 September 2023), there were 175 hospital admissions with COVID-19 reported at FluCAN sentinel sites, with 9.1% (16/175) admitted directly to ICU. The proportion of COVID-19 ICU admissions in the year-to-date (1 January to 24 September 2023) was 5.7% (223/3,920) compared with 6.1% (644/10,584) for the same period in 2022.

Figure 5: Weekly trends for patients admitted with confirmed COVID-19 to FluCAN sentinel hospitals, Australia, 13 December 2021 – 24 September 2023[a]



a Source: FluCAN.[4]

Table 5: Patient outcomes for adult COVID-19 cases (aged greater than or equal to 18 years), Australia, 15 December 2021 – 24 September 2023[a]

Outcomes	Current reporting period 28 August – 24 September 2023 (n = 67)	Omicron wave to date 15 December 2021 – 24 September 2023 (n = 6,137)
Patient status		
Ongoing care in ICU	26 (38.8%)	40 (0.7%)
Ongoing care in hospital ward [b]	13 (19.4%)	52 (0.8%)
Transfer to other hospital/facility	0 (0%)	420 (6.8%)
Transfer to rehabilitation	0 (0%)	593 (9.7%)
Discharged home	22 (32.8%)	3,801 (61.9%)
Mortality – ICU	5 (7.5%)	786 (12.8%)
Mortality – hospital ward	1 (1.5%)	322 (5.2%)
Unknown	0 (0%)	97 (1.6%)
Missing [c]	0 (0%)	26 (0.4%)

a Source: SPRINT-SARI.[5]

b Patients who were admitted in ICU/hospital wards with no discharge information for less than 90 days were assumed to have ongoing care in the hospital.

c Patients who were admitted to ICU/hospital wards for more than 90 days with no discharge information were treated as 'missing data'.

Short Period Incidence Study of Severe Acute Respiratory Infection—SPRINT-SARI

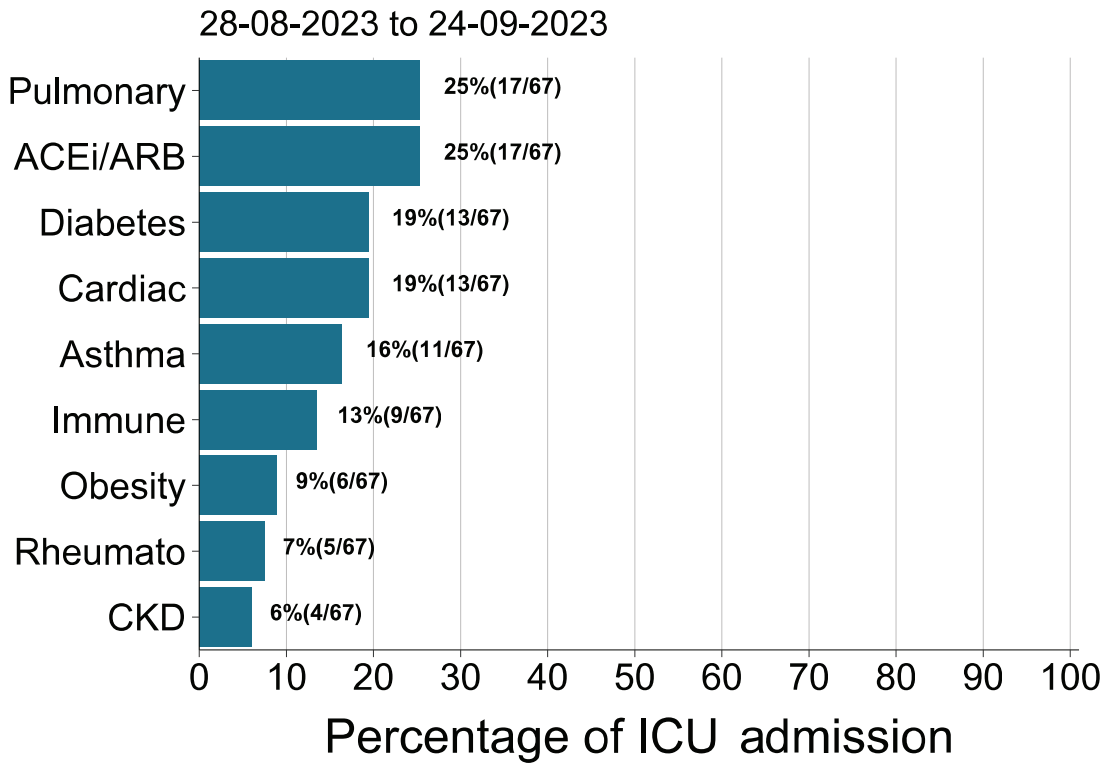
Between 15 December 2021 and 24 September 2023, there were 6,137 COVID-19 cases admitted to ICUs participating in the sentinel surveillance system Short Period Incidence Study of Severe Acute Respiratory Infection (SPRINT-SARI)[5] (Table 5). Most patients (61.9%; 3,801/6,137) were discharged home, 12.8% (786/6,137) died in ICU and 5.2% (322/6,137) died within the general hospital ward, with an overall in-hospital mortality rate of 18.1% (1,108/6,137).

In the four-week reporting period (28 August – 24 September 2023), there were 67 adult patients with COVID-19 (42 males, 25 females; median age: 62 years; interquartile range: 46–73 years) admitted to ICU reported at SPRINT-SARI sentinel sites (Table 5).

Since the start of the Omicron wave (15 December 2021) to 24 September 2023, for patients admitted to SPRINT-SARI sentinel sites with COVID-19 (n = 6,137), the median length of stay in ICU was 3.4 days (range: 0–88.9 days), the median length of stay in hospital was 10.9 days (range: 0.1–89.2 days) and the median duration of mechanical ventilation was 4.1 days (range: < 0.1–82.0 days).

During the four-week reporting period (28 August – 24 September 2023), for adult patients admitted to SPRINT-SARI sentinel sites with COVID-19 (n = 67), the median length of stay in ICU was 2.1 days (range: 0–9.0 days); the median length of stay in hospital was 7.0 days (range: 0.2–21.2 days); and the median duration of mechanical ventilation was 2.6 days (range: 0–7.5 days).

Figure 6: Prevalence of comorbidities for COVID-19 cases among admitted adult ICU patients (aged greater than or equal to 18 years), Australia, 28 August – 24 September 2023[a,b]



a Source: SPRINT-SARI. Only includes adult cases (≥ 18 years old) and excludes those with missing data on comorbidities or where comorbidity is unknown.

b Abbreviated comorbidities defined as: Cardiac: chronic cardiac disease; ACEi/ARB: past use of ACE inhibitor or A2 Blocker; CKD: chronic kidney disease; Pulmonary: chronic pulmonary disease (not including asthma); Immune: chronic immunosuppression; and Rheumato: rheumatologic disorder.

Risk factors for severe disease

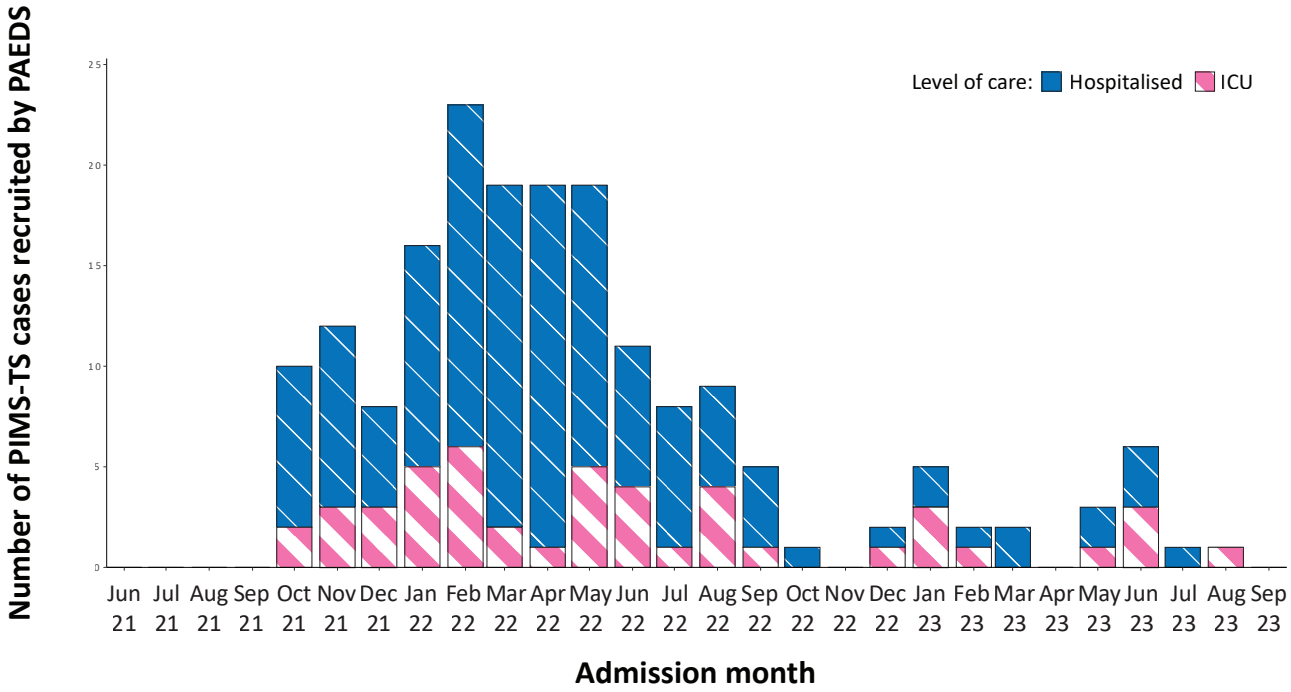
Comorbidity data extracted from SPRINT-SARI reflect the sickest patients with COVID-19 who are managed in ICU; data are therefore not generalisable to all cases. In adult patients admitted to ICU with COVID-19 during the four-week period 28 August – 24 September 2023, where comorbidity information was available, the most prevalent comorbidities were chronic pulmonary disease (25.4%) and past use of ACE inhibitor or A2 blocker (25.4%), followed by diabetes (19.4%) and chronic cardiac disease (19.4%) (Figure 6). Of those adult patients admitted to ICU during the four-week reporting period, for whom comorbidity data was known, 38.8% of adult ICU patients (26/67) had three or more comorbidities.

Paediatric Inflammatory Multisystem Syndrome – Temporally Associated with SARS-CoV-2

Paediatric Active Enhanced Disease Surveillance

Since the start of the pandemic to 24 September 2023, there have been 186 cases of paediatric inflammatory multisystem syndrome – temporally associated with SARS-CoV-2 (PIMS-TS) reported to the Paediatric Active Enhanced Disease Surveillance network (PAEDS), with no new cases reported in the last four weeks, and a total of 20 cases reported since the start of 2023 (Figure 7). The majority of PIMS-TS cases to date have occurred in those aged 5 to < 12 years (53%; 98/186), followed by those aged 6 months to < 5 years (27%; 51/186). To date, there have been no PIMS-TS associated deaths.

Figure 7: PIMS-TS cases reported to PAEDS, by sample month and level of care required, Australia, 1 June 2021 – 24 September 2023[a]



a Source: PAEDS.

Table 6: Deaths associated with COVID-19 by reporting period, Australia, 1 January 2020 – 24 September 2023 [a,b,c]

Jurisdiction [c]	14 August – 24 September 2023	Fifth Omicron wave 1 March – 13 August 2023	Fourth Omicron wave 24 October 2022 – 28 February 2023	Omicron wave to date 15 December 2021 – 24 September 2023	Pandemic to date 1 January 2020 – 24 September 2023
ACT	4 (1.9%)	46 (1.5%)	38 (1.0%)	264 (1.3%)	279 (1.2%)
NSW	69 (32.7%)	1,077 (34.4%)	1,065 (29.1%)	7,013 (33.5%)	7,715 (33.2%)
NT	0 (0.0%)	13 (0.4%)	18 (0.5%)	109 (0.5%)	110 (0.5%)
Qld	30 (14.2%)	518 (16.5%)	510 (13.9%)	3,368 (16.1%)	3,375 (14.5%)
SA	0 (0.0%)	235 (7.5%)	321 (8.8%)	1,664 (8.0%)	1,669 (7.2%)
Tas.	3 (1.4%)	54 (1.7%)	63 (1.7%)	294 (1.4%)	307 (1.3%)
Vic.	92 (43.6%)	967 (30.9%)	1,355 (37.0%)	6,923 (33.1%)	8,478 (36.5%)
WA	13 (6.2%)	222 (7.1%)	291 (7.9%)	1,277 (6.1%)	1,286 (5.5%)
Australia	**211 (100.0%)**	**3,132 (100.0%)**	**3,661 (100.0%)**	**20,912 (100.0%)**	**23,219 (100.0%)**

a Source: NNDSS, extract from 11 October 2023 for deaths with an illness onset date to 24 September 2023.

b Deaths are categorised into time periods using date of death. Deaths with a missing date of death are classified using date of illness onset.

c ACT: Australian Capital Territory; NSW: New South Wales; NT: Northern Territory; Qld: Queensland; SA: South Australia; Tas.: Tasmania; Vic.: Victoria; WA: Western Australia.

Table 7: COVID-19 associated case fatality rates among cases notified to NNDSS, by age group and date of onset, 1 January 2020 to 10 September 2023 [a,b,c,d]

Age group (years)	Omicron to date 15 December 2021 – 10 September 2023	Delta 16 June – 14 December 2021	Pandemic to date 1 January 2020 – 10 September 2023
0–9	< 0.05%	< 0.05%	< 0.05%
10–19	< 0.05%	< 0.05%	< 0.05%
20–29	< 0.05%	< 0.05%	< 0.05%
30–39	< 0.05%	0.06%	< 0.05%
40–49	< 0.05%	0.18%	< 0.05%
50–59	< 0.05%	0.65%	0.05%
60 +	1.09%	6.13%	1.19%
Unknown	0.00%	0.00%	0.00%
Australia	**0.18%**	**0.71%**	**0.20%**

a Source: NNDSS, extract from 11 October 2023 for deaths with an illness onset date to 10 September 2023.

b To account for the lag between illness onset and the development of severe illness, cases with an onset date in the last two weeks have been excluded from calculations of the case fatality rate.

c A value of 0.00% indicates that no COVID-19 associated fatalities occurred during the indicated period for the specified age group.

d Crude case fatality rates which reflect number of deaths as a proportion of reported COVID-19 cases during specific periods. Note, the current crude case fatality rates are likely overestimated due to changes in case ascertainment and increased underreporting of non-severe cases.

COVID-19 deaths

Since the beginning of the pandemic to 24 September 2023, there have been 23,219 COVID-19-associated deaths reported to the NNDSS, with 3,132 COVID-19-associated deaths notified throughout the fifth Omicron wave (1 March 2023 to 13 August 2023) (Table 6). The overall crude case fatality rate from the start of the Omicron wave to date is 0.18%, which is lower than the crude case fatality rate for the Delta wave (0.71%) (Table 7).

Genomic surveillance and virology

(Communicable Disease Genomics Network, AusTrakka and jurisdictional sequencing laboratories)

Variants of concern (VOC)

AusTrakka[6] is actively monitoring and reporting on one lineage and its associated sub- and sub-sub-lineages, currently designated as a variant of concern (VOC) by international organisations, including the World Health Organization (WHO): Omicron (B.1.1.529). The Omicron variant displays a characteristic set of mutations which differentiate the lineage from previously circulating VOCs. Further information on variants and their mutations is available in the Technical Supplement.[2]

There have been five major sub-lineages defined under B.1.1.529: BA.1, BA.2, BA.3, BA.4 and BA.5, and a large number of sub-lineages, including recombinants, under these; all are designated Omicron. Unlike previous periods

in Australia's COVID-19 waves, where one or two dominant lineages were the main driver of disease, there is currently significant diversity in the range of sub-sub-lineages circulating within Australia. During this reporting period, more than 200 unique lineages have been identified, and it is likely that there are more that are not being characterised through whole genome sequencing. This diversity of circulating lineages has sometimes been referred to as a 'variant soup'. Many of these circulating lineages will die out without causing a significant disease burden, but others appear to have stronger growth potential.

Variants of interest and variants under monitoring

The Communicable Diseases Genomics Network (CDGN) VOC working group tracks notable SARS-CoV-2 variants, including:

- three variants of interest (VOI), XBB.1.5, XBB.1.16, and EG.5; and
- the following variants under monitoring (VUMs) and their descendent lineages: BA.2.75 and BA.2.75.2 (including CH*), BQ.1 and BQ.1.1*, and recombinants XBB* (in particular XBB.1.9.1* and XBB.1.9.2*), and XBF*.

This report uses the variants of interest (VOI) classification for lineages with possible evidence for epidemiological, pathological or immunological features of concern. This is consistent with CDGN usage and with the WHO use of the term.[7,8] Variants under monitoring (VUM) are other lineages with early observations of potential significance, but little to no evidence of current concern. In this report, details are included of Omicron subvariants under monitoring as designated by the WHO.

AusTrakka SARS-CoV-2 genomic epidemiology

From 28 August to 24 September 2023, there were 462 sequences uploaded to AusTrakka, with the most recent collection date of 19 September 2023. This represents a 84% increase in the number of sequences compared to the previous reporting period. All sequences uploaded during this reporting period have been assigned to sub-lineages within B.1.1.529 (Omicron) or to recombinants consisting of one or more Omicron sub-lineages.

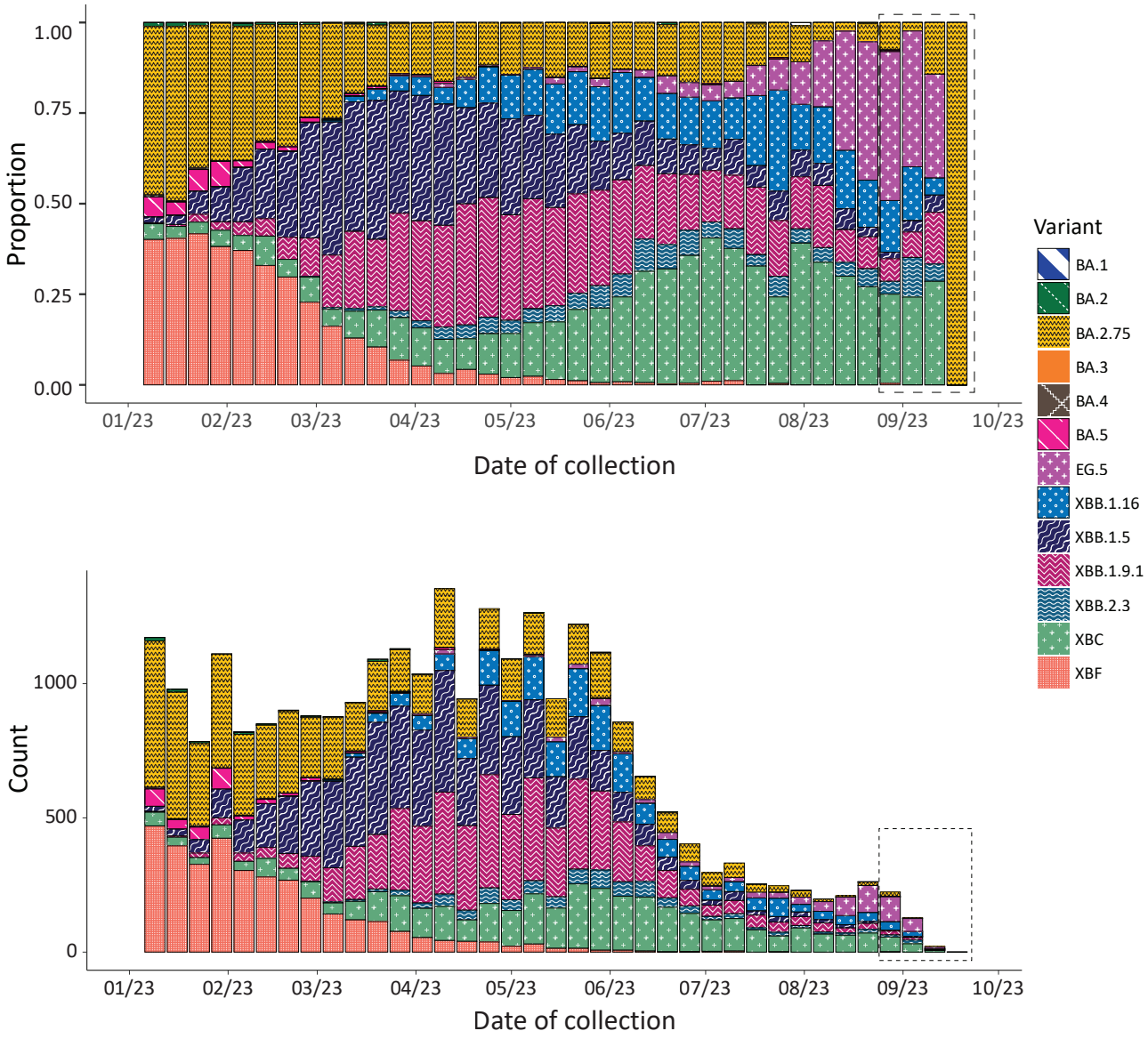
Of the 462 sequences uploaded to AusTrakka between 28 August and 24 September 2023:

- 94.6% (437/462) were recombinant or recombinant sub-lineages;
- 5.2% (24/462) were BA.2.75 sub-sub lineages; and
- One sequence (0.2%, 1/462) belonged to a BA.5 sub-lineage (Figure 8).

No other BA.1, BA.3 or BA.4 Omicron sub-lineages were identified.

From 1 July 2023, jurisdictional sequencing strategies for SARS-CoV-2 have changed. Some jurisdictions have ceased SARS-CoV-2 sequencing, while other jurisdictions have reduced the number of SARS-CoV-2 cases being sequenced. For jurisdictions which are continuing SARS-CoV-2 genomic surveillance, SARS-CoV-2 cases which are likely to be prioritised for sequencing include ICU or hospitalised cases, high-risk cases, or cases of clinical significance. As a result, these changes are likely to affect the representativeness of the distribution of SARS-CoV-2 sub-lineages across Australia.

Figure 8: Omicron sub-lineage in Australia since 1 January 2023 by sample collection date, showing (A) proportions and (B) count per week[a,b,c]



a Sequences in Australia aggregated by epidemiological week.

b The dashed box indicates the distribution of sequences collected within the reporting period.

c Proportions in Figure 8A may not be representative when sequence numbers are small; refer to Figure 8B. Data for earlier epidemiological weeks may change between reporting periods as sequences with older collection dates are uploaded. These numbers are not equivalent to number of cases, as there are many cases which may not be sequenced. Non-VOI and non-VUM Omicron sub-lineages have been collapsed into parent lineages BA.1, BA.2, BA.3, BA.4 and BA.5.

Table 8: Australian SARS-CoV-2 genome sequences in AusTrakka, identified as variants of concern, variants of interest or variants under monitoring and proportion of positive cases sequenced for the current and previous reporting periods, and since 23 January 2020[a,b,c]

Variant category	Measure	Reporting period 28 August – 24 September 2023	Previous reporting period 31 July – 27 August 2023	Total sequences to date 23 January 2020 – 24 September 2023
Variants of concern (VOC)	BA.1	0 (0%)	2 (0.8%)	26,272 (16.5%)
	BA.2 (excluding BA.2.75)	0 (0%)	0 (0%)	41,655 (26.1%)
	BA.2.75	24 (5.2%)	24 (9.6%)	14,351 (9.0%)
	BA.3	0 (0%)	0 (0%)	3 (< 0.1%)
	BA.4	0 (0%)	0 (0%)	5,052 (3.2%)
	BA.5	1 (0.2%)	0 (0%)	43,203 (27.1%)
	Total recombinants	437 (94.6%)	225 (89.6%)	29,153 (18.3%)
	Total VOC	**462 (100%)**	**251 (100%)**	**159,689 (100%)**
Variants of interest (VOI)	XBB.1.5 + sub-lineages	15 (3.2%)	9 (3.6%)	5,454 (3.4%)
	XBB.1.16	60 (13.0%)	52 (20.7%)	3,943 (2.5%)
	EG.5 (XBB.1.9.2.5)[d]	138 (29.9%)	27 (10.8%)	525 (0.4%)
Variants under monitoring (VUM)	XBB + all sub-lineages	319 (69.0%)	123 (49.0%)	1,8049 (11.3%)
	XBB.1.9.1, XBB.1.9.2 + sub-lineages	165 (35.7%)	47 (18.7%)	5,458 (3.4%)
	XBB.2.3	35 (7.6%)	4 (1.6%)	1,128 (0.7%)
	XBF	1 (0.2%)	0 (0%)	6,558 (4.1%)
	XBC	90 (19.5%)	81 (32.3%)	3,999 (2.5%)
	BA.2.86	1 (0.2%)	0 (0%)	1 (< 0.1%)
Omicron BA.2	BA.2.75 + sub-lineages	24 (5.2%)	24 (9.6%)	14,351 (9.0%)
	CH.1.1 + sub-lineages (BA.2.75.1.1)	24 (5.2%)	24 (9.6%)	4,333 (2.7%)

a All lineages have been designated as variants of concern (VOC), variants of interest (VUI) or variants under monitoring (VUM) in Australia, by the CDGN VOC working group.

b Sequencing of samples from cases identified in the reporting period may be in process at the time of reporting. Remaining unsequenced samples may be due to jurisdictional sequencing strategy, or where samples have been deemed unsuitable for sequencing (typically because viral loads were too low for sequencing to be successful).

c Proportional changes compared to the previous 28-day period are highlighted by the following colours: **green boxes indicate a decrease**; **orange boxes indicate an increase** and **blue boxes indicate no change/stable.**

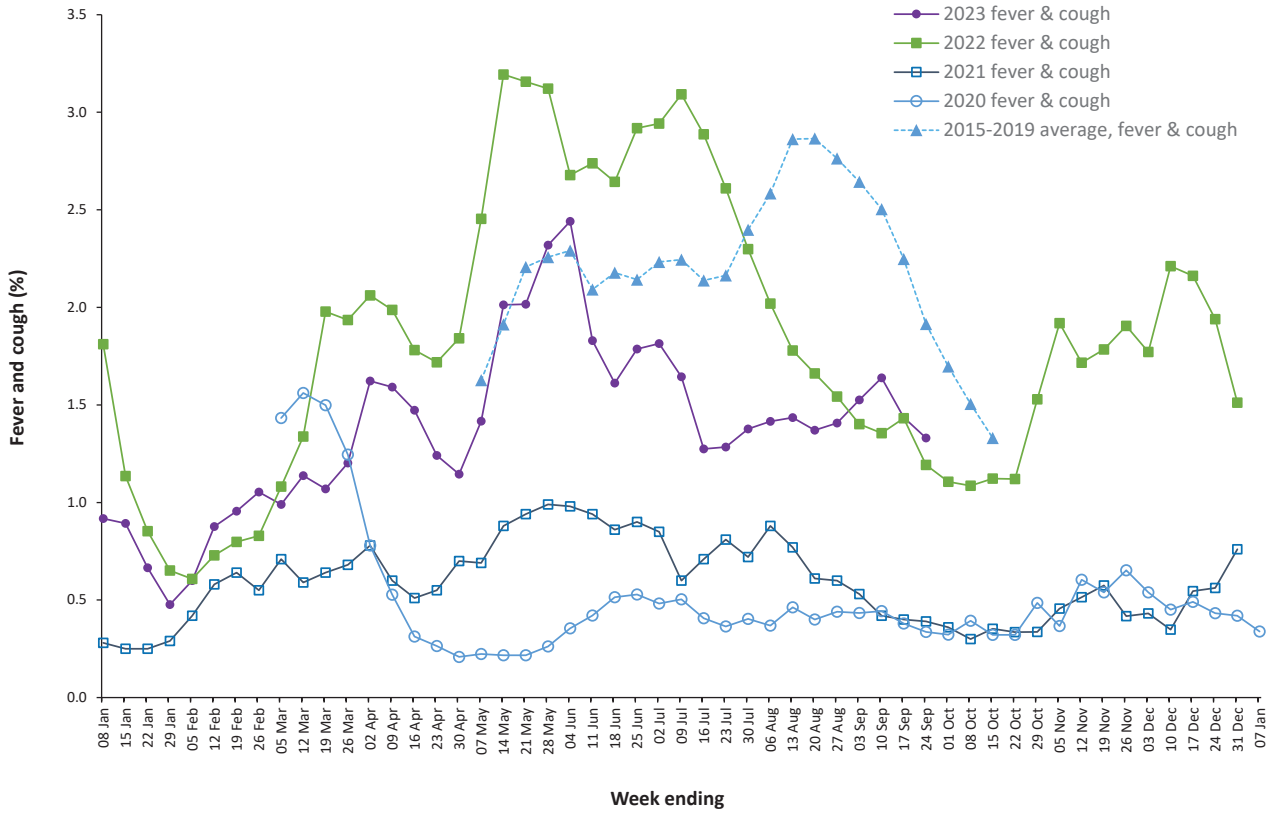
d Newly added to the VOC/VUM/VOI list.

Case numbers and sequencing proportion are primarily based on polymerase chain reaction (PCR) results only, as RATs do not allow for sequencing. Since late 2022, the rates of PCR for testing and subsequent referrals of positive PCR samples to sequencing laboratories have decreased significantly, resulting in changes to sequencing strategies across the country.

The Australian SARS-CoV-2 genome sequences in AusTrakka identified as VOCs, VOIs or VUMs are highlighted in Table 8. The VOIs and VUMs where the proportion has increased compared to the previous reporting period are highlighted in yellow, those that have remained stable are highlighted in blue, while those where proportions have decreased are highlighted in green.

In the reporting period to 24 September 2023, the VOI EG.5 (XBB.1.9.2.5) has continued to increase, up from 10.8% in the previous reporting period, to 28.5%. Other XBB sublineages, including the VUM XBB.2.3 have also risen (Table 8), however XBB.1.16 has continued to decrease, from 30.5% in the July reporting period, to 12.3% in the reporting period to 24 September. The previously prevalent lineage XBB.1.5 now accounts for just 3.1% of sequences uploaded to AusTrakka. The proportion of BA.2.75 sub-lineages (including CH1.1) has also decreased, down from 9.6% in the July-August period, to 5.2% now (Table 8). AusTrakka has also had the first BA.2.86 sequence uploaded to the system (Table 8). BA.2.86 has recently been designated as a Variant Under Monitoring (VUM) by the WHO.

Figure 9: Weekly trends in fever and cough amongst FluTracking survey participants (age-standardised) compared to the average of the previous five years, Australia, 1 January 2020 – 24 September 2023[a]



a In years prior to 2020, FluTracking was activated during the main Influenza season from May to October. A historical average beyond the week ending 11 October is therefore not available. In 2020, FluTracking commenced ten weeks early to capture data for COVID-19.

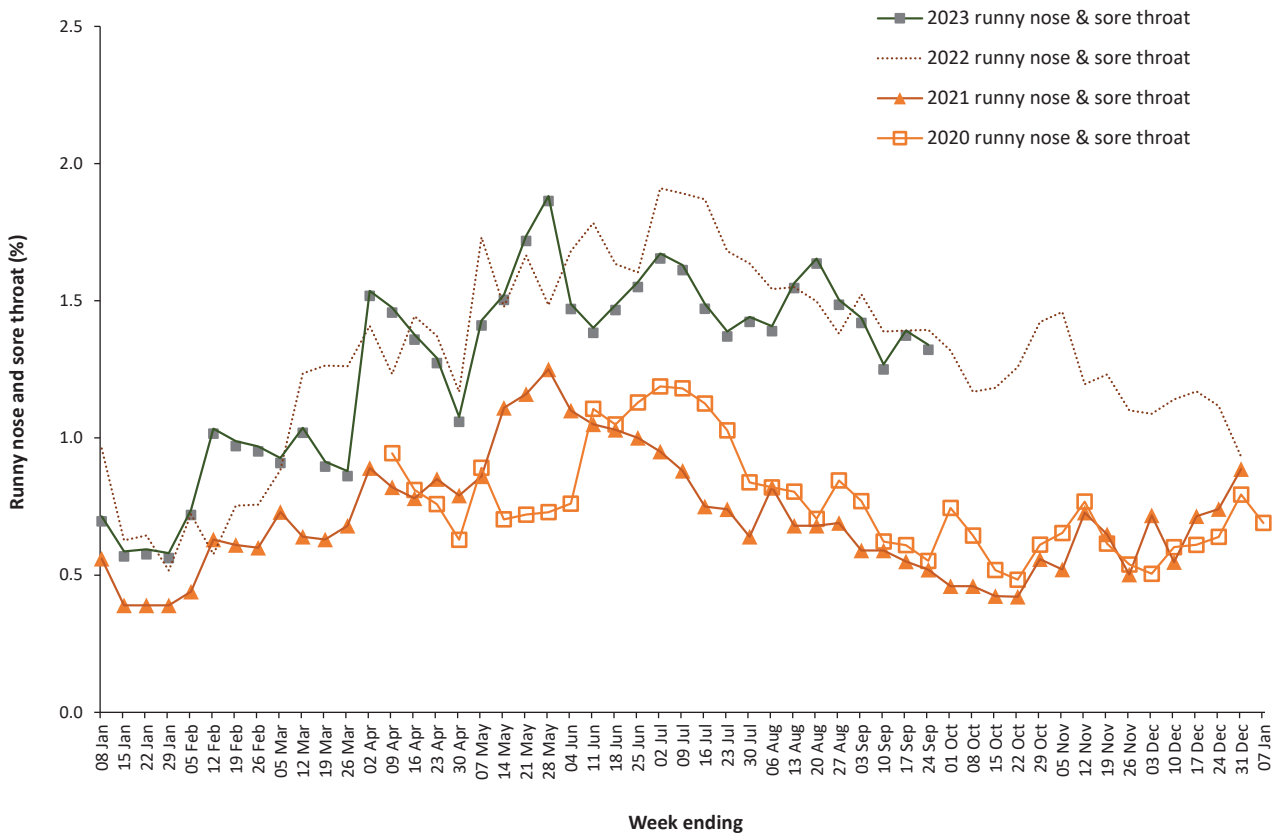
Acute respiratory illness
(FluTracking, ASPREN)

Based on self-reported FluTracking data,[9] there has been a decrease in the incidence of 'fever and cough' symptoms since the peak in early June 2023 at 2.4%. In the current four-week reporting period the average proportion of 'fever and cough' symptoms is 1.5%, which is slightly higher than the proportion observed during the same period in 2022 (Figure 9).

The incidence of 'runny nose and sore throat' symptoms has decreased since the peak in the week ending 28 May 2023 (1.9%) with two subsequent smaller increases observed in the week ending 2 July 2023 (1.7%) and 20 August 2023 (1.6%). In the current four-week reporting period the average proportion of 'runny nose and sore throat' symptoms is 1.3%, which is slightly lower than the proportion observed during the same period in 2022 (Figure 10).

Over the reporting period, FluTracking data indicated that 10.5% of participants with 'fever and cough' were tested for SARS-CoV-2 with a PCR test and 66.9% were tested using a RAT (noting that in some instances RATs will be followed up by a PCR test for the same case). Of those with 'runny nose and sore throat', 34.3% were tested for SARS-CoV-2 using a PCR test and 13.7% were tested using a RAT. In the current reporting period, the percent positivity for 'fever and cough' symptoms increased for both PCR (8.4%) and RAT (22.7%) compared to the previous reporting period. For 'runny nose and sore throat' symptoms, the percent positivity was similar for PCR (4.7%) and increased for RAT (5.0%). Note that participants with one set

Figure 10: Weekly trends in runny nose and sore throat symptoms amongst FluTracking survey participants (age-standardised), Australia, 29 March 2020 – 24 September 2023[a]



a Data on runny nose and sore throat were only collected systematically after 29 March 2020, therefore a historical average for this symptom profile is unavailable.

of symptoms are not excluded from having the other. It is important to acknowledge that there may be legitimate reasons why people did not get tested, including barriers to accessing testing. Symptoms reported to FluTracking are not specific to COVID-19 and may also be due to infections with other respiratory pathogens and to chronic diseases, such as asthma.

Since the start of 2023 to 24 September 2023, of those presenting to sentinel ASPREN sites with influenza-like illness who were tested for respiratory viruses, 62.0% (815/1,314) tested positive for a respiratory virus, similar to the previous four-week period. Among those positive, the most common viruses detected were rhinovirus (33.3%; 271/815) followed by influenza A (18.8%; 153/815), influenza B (14.4%; 117/815) and respiratory syncytial virus (10.8%; 88/815).

COVID-19 trends by WHO region

Current trends in reported COVID-19 cases are an underestimate of the true number of global infections due to the reduction in testing and reporting in many countries. Data presented in this section may be incomplete and should, therefore, be interpreted with caution.

As of 24 September 2023, over 770 million COVID-19 cases and over six million deaths have been reported globally since the start of the pandemic, with a global case fatality rate (CFR) of approximately 0.90%.[10] At the global level, the number of newly reported cases and deaths in the four-week period to 24 September 2023 decreased by 55% and 34%, respectively (Table 9). During the reporting period only 41% of countries (96 of 234) reported at least one case to WHO – a proportion that has been declining since mid-2022.

Table 9: Newly reported and cumulative COVID-19 cases and deaths, by WHO Region, reported in the four-week period to 24 September 2023[a,b]

WHO Region	Countries reporting cases in the last 4 weeks	Cumulative cases	New cases reported in the last 4 weeks	Change in new cases in the last 4 weeks [b]	Cumulative deaths	New deaths reported in the last 4 weeks	Change in new deaths in the last 4 weeks [b]
Western Pacific	20/35 (57%)	207,284,734	458,757	-65%	417,745	977	-15%
Europe	27/61 (44%)	276,134,635	177,642	+19%	276,134,635	661	-54%
South-East Asia	7/10 (70%)	61,205,037	3,070	-23%	806 781	118	+111%
Eastern Mediterranean	5/22 (23%)	23,394,122	5,201	+53%	351,465	64	+88%
Americas [c]	21/56 (38%)	193,286,267	38,858	+3%	2,959,269	122	-58%
Africa	16/50 (32%)	9,569,874	1,634	-92%	175,435	8	+33%
Global	**96/234 (41%)**	**770,875,433**	**685,162**	**-55%**	**6,959,316**	**1,950**	**-34%**

a Source: World Health Organization Coronavirus (COVID-19) Dashboard,11 accessed on 29 September 2023, for data until 24 September 2023.

b Percent change in the number of newly confirmed cases/deaths in the most recent four-week period compared to the four weeks prior.

c Since 11 September 2023, data from the Region of the Americas was changed to aggregated national surveillance, received through the COVID-19, Influenza, RSV and Other Respiratory Viruses program. Data have since been included retrospectively since 31 July 2023

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Appendix A: Supplementary figures and tables

Table A.1: COVID-19 cases and rates per 100,000 population, by age group, sex, and date of onset, Australia, 15 December 2021 – 24 September 2023[a,b,c,d]

Age group (years)	Four-week reporting period						Entire 'Omicron' wave to date					
	28 August – 24 September 2023						15 December 2021 – 24 September 2023					
	Cases			Rate per 100,000 population			Cases			Rate per 100,000 population		
	Male	Female	People[d]	Male	Female	People[d]	Male	Female	People[d]	Male	Female	People[d]
0–9	765	723	1,501	47.7	47.7	48.1	524,352	498,006	1,143,207	32,667.9	32,849.3	36,627.9
10–19	539	629	1,188	33.0	40.9	37.5	659,959	701,088	1,497,690	40,435.0	45,553.8	47,228.2
20–29	635	1,328	2,014	36.1	78.7	58.4	799,500	978,081	1,903,528	45,392.7	57,962.7	55,195.1
30–39	998	1,835	2,877	53.0	95.7	75.7	824,261	1,029,994	2,001,592	43,808.6	53,709.1	52,684.1
40–49	932	1,732	2,705	56.7	103.0	81.4	683,863	867,507	1,673,290	41,627.6	51,606.2	50,342.3
50–59	974	1,727	2,755	62.1	106.7	86.5	554,773	688,981	1,331,990	35,386.6	42,554.7	41,797.2
60–69	1,090	1,507	2,640	80.6	104.5	94.5	402,412	466,444	922,785	29,743.2	32,354.5	33,020.0
70–79	1,135	1,148	2,306	117.0	109.6	114.3	257,348	262,503	544,898	26,520.2	25,054.3	27,000.2
80–89	801	956	1,773	199.0	191.9	196.9	116,666	132,233	258,453	28,989.2	26,547.1	28,699.4
90 +	274	519	810	361.3	373.6	377.2	30,422	56,376	89,546	40,115.5	40,585.1	41,699.0

a Source: NNDSS, extract from 11 October 2023 for notifications to 24 September 2023.
b Population data based on Australian Bureau of Statistics (ABS) Estimated Resident Population (ERP) as at June 2022.
c Excludes cases where age was unknown.
d Total cases includes those where sex was unknown and those classified as X, i.e., persons who reported their sex as another term, other than male or female.