Australian Centre for Disease Control

Technical supplement

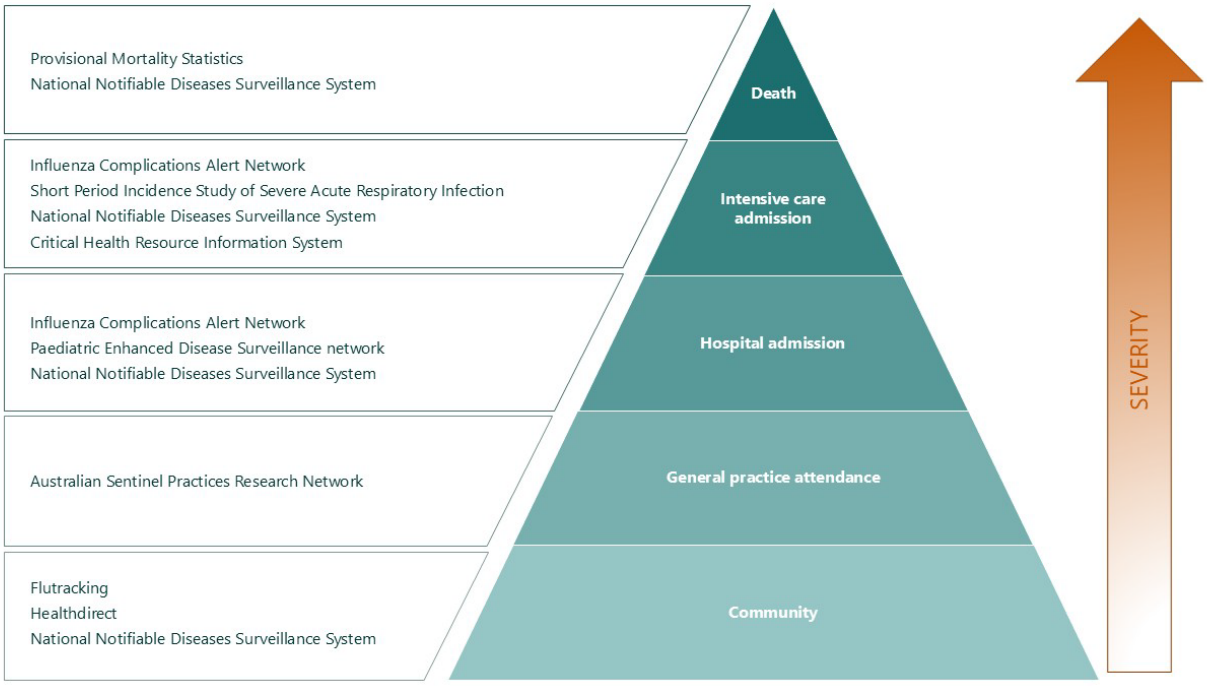
Australian Respiratory Surveillance Report

Data sources and considerations

This technical supplement describes the background to Australia's surveillance of acute respiratory illnesses, including coronavirus disease 2019 (COVID-19), influenza, and respiratory syncytial virus (RSV). The technical supplement also describes each of the data sources used and any associated data considerations for the Australian Respiratory Surveillance Report series, which reports against the surveillance indicators detailed in the Australian National Surveillance Plan for COVID-19, Influenza and RSV.

Communicable disease surveillance in Australia operates at the national, jurisdictional, and local levels, and with no single system providing complete picture of acute respiratory illnesses epidemiology. Instead, several surveillance systems collect information that together build a picture of the distribution and burden of disease to support evidence-based public health decision-making and outcomes.[1] These surveillance systems are based in the community, primary care, hospitals and laboratories to capture information about different people, places, and levels of severity. In the Australian Respiratory Surveillance Report, notifiable diseases data and civil registration systems data are used alongside information from sentinel surveillance systems.

Figure 1. Levels of acute respiratory illness disease severity and some data sources used in Australia adapted from Technical supplement – COVID-19 Australia: Epidemiology reporting[2]



The COVID-19 pandemic had considerable impacts on circulating acute respiratory infections and acute respiratory illness surveillance systems limiting direct comparisons between 2020–2021 and other seasons. Public health and social measures and changes in healthcare-seeking behaviour, testing practices and increased utilisation of telehealth services influenced reported respiratory illness.

COVID-19 related public health and social measures including international and domestic border restrictions, social distancing measures, and mask mandates were used across 2020–2021 to limit the importation and spread of COVID-19; however, these measures also effectively interrupted acute respiratory illness circulation during this time.[3-5] Due to the unusually low circulation of respiratory infections during 2020 and 2021, these years are excluded from historical comparisons and five-year averages.

Community surveillance

National Notifiable Diseases Surveillance System (NNDSS)

Australia is a federation of six states – New South Wales (NSW), Queensland (Qld), South Australia (SA), Tasmania (Tas), Victoria (Vic), and Western Australia (WA) – and two territories: the Australian Capital Territory (ACT) and the Northern Territory (NT). State and territory health departments collect notifications of communicable diseases under their respective public health legislations. Surveillance methods and notification requirements for medical practitioners, laboratories and hospitals vary between states and territories.[6]

The NNDSS coordinates national surveillance of more than 70 communicable diseases that are notifiable in all states and territories. Under the *National Health Security Agreement (2007)*, states and territories provide de-identified data on communicable diseases listed on the National Notifiable Diseases List to the NNDSS for national collation, analysis, reporting and support by the Australian Centre for Disease Control (CDC).[6,7]

The NNDSS requires the following mandatory data fields for case notification: a unique record reference number; notifying state or territory; disease code; confirmation status; and the notification received date. In addition, core data fields are supplied where available, including but not limited to, date of birth, age at onset, sex, Indigenous status, death status, and disease onset date. Enhanced surveillance information including the serogroups/subtypes of organisms isolated and the hospitalisation or immunisation status, may also be reported where relevant.[6] However, public health follow-up is not routinely undertaken for diseases with high notification volumes or for those that do not require specific case-based public health action, meaning enhanced surveillance data are often unavailable.[8,9]

Notes on case definitions

Each notifiable disease is governed by a national surveillance case definition that state and territory health departments use to decide whether to report a case to the NNDSS.[10]

Laboratory-confirmed influenza has been nationally notifiable in Australia since 2001. On 1 January 2022, the influenza surveillance case definition was updated to remove: '*Single high titre by complement fixation test (CFT) or haemagglutination inhibition (HAI) to influenza virus*' from the list of laboratory definitive evidence. This change has had minimal impact on the interpretation of influenza notification trends, with the change ensuring consistency with the influenza laboratory case definition.[11] The influenza surveillance case definition was last updated on 1 July 2023 to clarify the use of point-of-care testing as laboratory evidence.

COVID-19 became nationally notifiable in January 2020 following the emergence of the novel coronavirus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The COVID-19 surveillance case definition was last updated on 10 July 2024 to remove the requirement to notify probable cases (those positive by rapid antigen test [RAT]). Seven jurisdictions had ceased collecting and notifying self-reported RAT results to the NNDSS prior to the surveillance case definition change: Vic ceased on 1 July 2023, Qld on 1 September 2023, NSW on 1 October 2023, WA on 9 October 2023, the NT on 21 October 2023, the ACT on 22 December 2023, and Tas on 12 April 2024. Due to the high proportion of missing probable case data and variable completeness over time, analyses of probable cases are not presented in the Australian Respiratory Surveillance Report series.

RSV became nationally notifiable on 1 July 2021, and the RSV surveillance case definition was last updated on 1 July 2023 to clarify the use of point-of-care testing as laboratory evidence. However, comprehensive national notification data became available after 1 September 2022. For this reason, RSV notification trends are only presented from 1 January 2023.

Notes on interpretation

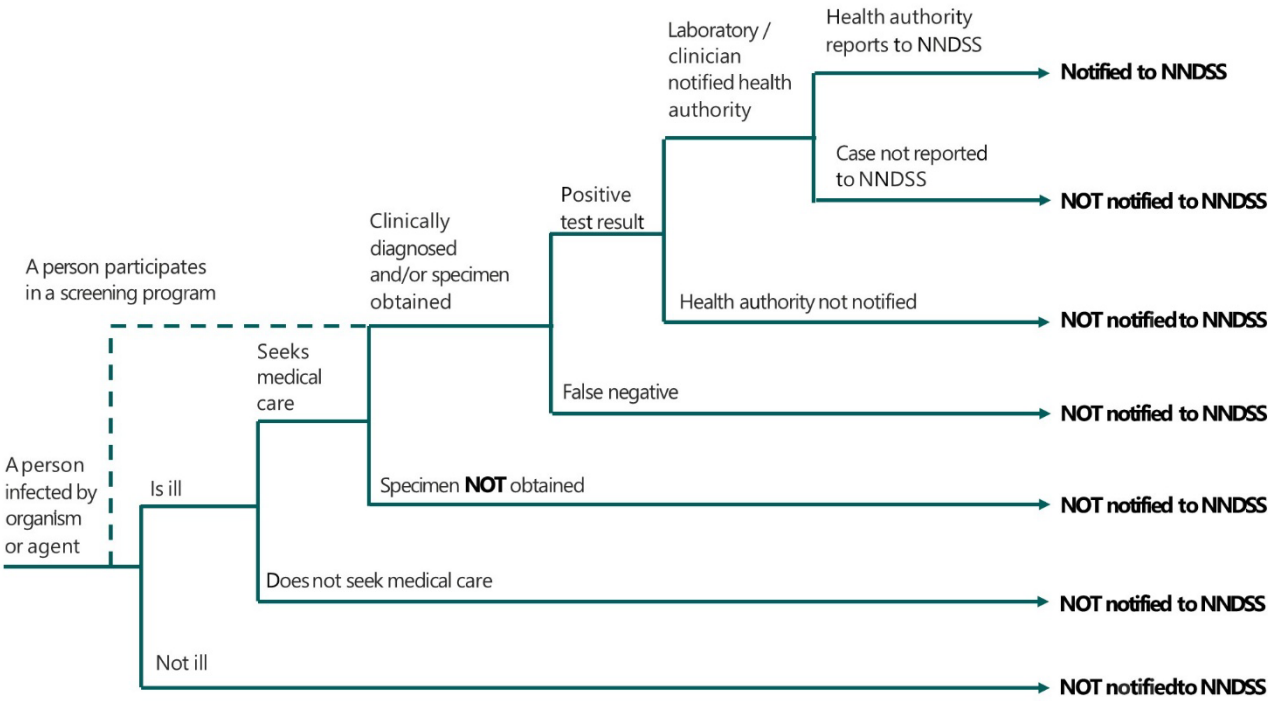
Data from the NNDSS are analysed and reported based on diagnosis date, which is the true onset date of a case if known. If the onset date is unavailable, date of diagnosis is defined as the earliest of specimen collection date; notification date; or notification received date. In the NNDSS:

- true onset date represents, or approximates, the earliest date symptoms occurred
- specimen date represents the date when the first laboratory specimen was collected
- notification date represents the date a health professional signed the notification form, or the laboratory issued the test result
- notification received date represents the date the notification of the disease was first received by the relevant health authority.

Throughout the Australian Respiratory Surveillance Report series, the terms 'cases' or 'notified cases' refer to individuals for whom a disease 'notification' has been received by the NNDSS. These represent only a proportion of the true incidence of a disease in the community (the 'notified fraction'; Figure 2) which varies by disease, jurisdiction and over time. This limitation is particularly relevant for acute respiratory infections, many of which are now diagnosed by RAT, and therefore generally not reported to health authorities. Consequently, only a fraction of acute respiratory infections are captured in the NNDSS and included in the Australian Respiratory Surveillance Report series.

In addition, when interpreting notifiable diseases data from the NNDSS, it is important to note that changes in notifications over time may not solely reflect changes in disease prevalence or incidence. Depending on the disease, the number of notifications may be influenced by changes in case definitions; changes in reporting practices; changes in testing practices and screening programs; the use of less invasive and more sensitive diagnostic tests; periodic awareness campaigns; and the use of other public health and social measures.

Figure 2: Communicable diseases notifiable fraction



The completeness and reliability of particular indicators such as Indigenous status, hospitalisations, intensive care admissions or deaths associated with acute respiratory infections has varied prior to and throughout the pandemic. This is because these indicators are sourced in different ways by state and territories based on their local surveillance system capabilities, definitions, priorities, and needs. The completeness and reliability of these indicators have decreased over time and are now inadequate for meaningful interpretation. This is due to several factors, including:

- most laboratory notifications do not include these indicators
- case follow-up for these acute respiratory infections are not routinely conducted and not a requirement of notification
- it is not possible to follow up all cases for diseases with a large volume of notifications
- these indicators are not a requirement of notification
- data linkage systems that have been used to help capture these indicators for COVID-19 have not been extended in the post emergency climate or to other acute respiratory infections

In particular, notification data are no longer reported on for Indigenous status, vaccination status, hospitalisations, intensive care admissions or deaths due to issues with reliability and completeness. Instead, sentinel surveillance or civil registration systems data are used to provide more complete and representative estimates.

healthdirect Australia

healthdirect Australia is a government-funded national virtual health service that provides health information and advice via a website, application and telephone helpline. The helpline provides health information and advice, including recommendations for self-care, primary care, emergency department attendance, or emergency services where appropriate.

Notes on definitions

A screening definition was used to identify callers with influenza-like illness (ILI). Included callers had at least one of the following symptoms recorded as an initial symptom in the clinical decision support system: fever, cough, headache, sore throat, chills, rigors, myalgia, coryza or fatigue. The screening definition was informed by the CDNA Series of National Guidelines for influenza infection. The screening definition is symptom-based and identifies callers reporting symptoms consistent with ILI; however, it does not represent laboratory-confirmed influenza and cannot distinguish influenza from other respiratory infections with similar clinical presentations.

Callers referred to seek urgent medical care include those referred to call triple zero, attend a hospital emergency department, contact a virtual emergency department, urgent care clinic or see a general practitioner within two hours.

Data are based on symptoms recorded during triage and may be influenced by caller reporting, nurse assessment, and the clinical decision support system used to classify presentations.

Notes on interpretation

Healthdirect data reflect healthcare-seeking behaviour among individuals who choose to access a telephone triage service and therefore may not be representative of the broader population. Call volumes may be influenced by changes in healthcare access, public awareness, media coverage, health-seeking behaviour, and availability of alternative health services, independent of underlying disease activity.

Healthdirect became operational in 2007 in all jurisdictions except Vic and Qld. Healthdirect Australia assumed management of Vic's NURSE-ON-CALL service in 2021; however, in 2025 Queensland continued to operate a separate nurse triage service. Consequently, Healthdirect helpline data are not representative of Qld residents.

FluTracking

FluTracking is a national online participatory surveillance system established in Australia in 2006. Participants voluntarily complete weekly surveys reporting respiratory symptoms, healthcare-seeking behaviour and testing practices. FluTracking provides a consistent measure of community respiratory illness activity and is less influenced by healthcare-seeking behaviour, clinician testing practices and jurisdictional surveillance differences.

Notes on definitions

A participant was defined as an individual for whom a survey was submitted, either by themselves or on their behalf. The percentage reporting fever and cough was calculated using participants reporting new fever and cough symptoms as the numerator and all participants completing a survey that week as the denominator. Consecutive reports of fever and cough were considered part of the same illness episode and only the first week contributed to incidence estimates. A new episode was defined as fever and cough following at least one symptom-free week.

Participants reporting time off work or normal duties, seeking medical advice or care, testing for COVID-19, influenza or RSV, or reporting a test result while experiencing fever and cough were assigned to the survey week in which new fever and cough symptoms were first reported.

Data on time off work or normal duties and healthcare utilisation are reported with a two-week delay in this report to allow for the interval between symptom onset and subsequent outcomes. Medical advice or care included attendance at a general practitioner, Aboriginal and Torres Strait Islander health clinic, COVID-19 clinic, emergency department, or hospital admission. The COVID-19 testing centre/drive-through response option was removed on 6 June 2024.

Percent positivity was calculated separately for each pathogen and test type using the relevant testing population as the denominator.[12]

Notes on interpretation

Participation is voluntary and participants may not be representative of the broader Australian population. Aboriginal and Torres Strait Islander participants are underrepresented relative to the Australian population and, and estimates may be subject to greater uncertainty due to smaller sample sizes. Direct age standardisation is used to facilitate comparisons over time and between populations.

Symptom, testing and healthcare utilisation data are self-reported. Although FluTracking is less influenced by healthcare-seeking behaviour than healthcare-based surveillance systems, findings may be affected by self-selection bias and differences in participation across population groups.

Participants may opt out during the interseasonal period (November to March) and are invited to rejoin on 1 April each year, resulting in smaller sample sizes during the interseasonal period.[12]

General practice surveillance

Australian Sentinel Practices Research Network (ASPREN)

ASPREN is a year-round, nationally representative, network of about 225 sentinel general practices sites in which general practitioners and nurse practitioners report de-identified information on selected conditions, including ILI, seen in participating sites each week. Participating practitioners are required to report the total number of patients seen weekly (i.e., weekly consultations) as well as notifying when they see a patient fitting the relevant case definition. Consistent with international general practice surveillance systems, rates are reported as the number of ILI notifications per 1,000 consultations per week.

Practitioners invited a systematic sample of patients with ILI to participate in virological surveillance, comprising the first three patients presenting with ILI each week and all patients aged ≤5 years and ≥65 years. Respiratory swabs were collected and tested by SA Pathology using multiplex real-time reverse transcription polymerase chain reaction (PCR) assays for respiratory pathogens. Positive influenza samples were referred to the World Health Organization Collaborating Centre for Reference and Research on Influenza (WHO CCRRI) and contributed to national and international influenza vaccine strain selection.

Notes on vaccine effectiveness (VE) estimates

The Global Influenza Vaccine Effectiveness (GIVE) Collaboration synthesises influenza VE estimates from studies conducted in northern and southern hemispheres. Australian estimates are derived from ASPREN and FluCAN-PAEDS.

Data were used to estimate VE against laboratory-confirmed influenza-associated general practice attendance using a test-negative design, in which VE was estimated as 1 minus the odds ratio of vaccination among influenza-positive cases compared with test-negative controls. The test-negative design reduces bias associated with healthcare-seeking behaviour; however, VE estimates may still be affected by residual confounding, misclassification of vaccination status, and the representativeness of participating sentinel sites.

Notes on case definitions

ILI was defined as an acute respiratory infection with fever (reported or measured) and cough, with symptom onset within the previous 7 days, consistent with the WHO surveillance case definition for ILI.

Notes on interpretation

ASPREN is a sentinel surveillance system and participating practices may not be fully representative of all Australian general practices or the broader Australian population. ILI rates reflect presentations to participating practices and may be influenced by healthcare-seeking behaviour, consultation practices and access to care.

The availability of telehealth and respiratory clinics since the COVID-19 pandemic may have reduced in-person presentations and respiratory specimen collection in participating practices. Consequently, comparisons with pre-pandemic seasons may be affected by changes in healthcare utilisation and surveillance practices.

Virological surveillance is based on a systematic sampling strategy and may not fully represent all ILI presentations. Although virological surveillance was broadly representative, SA was overrepresented and the NT was underrepresented.

Hospital-based surveillance

Influenza Complications Alert Network and the Paediatric Active Enhanced Disease Surveillance (FluCAN-PAEDS)

FluCAN-PAEDS is hospital-based sentinel surveillance system for severe acute respiratory infections with 23 sites (18 sentinel and 5 paediatric specific sites) across all jurisdictions contributing clinical and laboratory data. FluCAN was initially established to monitor seasonal influenza hospitalisations in 2009. Since 2014, the PAEDS network has partnered with FluCAN to contribute data on paediatric (those aged 16 years or under) admissions with select acute respiratory infections at sentinel hospital sites. This provides enhanced surveillance of these at-risk populations. In 2020, FluCAN was modified to capture COVID-19 hospitalisations and again in 2024 to capture RSV hospitalisations.

Positive influenza samples were referred to the WHO CCRRI and contributed to national and international influenza vaccine strain selection.

Notes on VE estimates

The GIVE Collaboration synthesises influenza VE estimates from studies conducted in northern and southern hemispheres. Australian estimates are derived from ASPREN and FluCAN-PAEDS.

Data were used to estimate VE against laboratory-confirmed influenza-associated hospitalisation using a test-negative design, in which VE was estimated as 1 minus the odds ratio of vaccination among influenza-positive cases compared with test-negative controls. The test-negative design reduces bias associated with healthcare-seeking behaviour; however, VE estimates may still be affected by residual confounding, misclassification of vaccination status, and the representativeness of participating sentinel hospital sites.

Notes on case definitions

Cases were defined as patients admitted to a participating sentinel hospital with laboratory-confirmed COVID-19, influenza or RSV infection. Laboratory confirmation was based on polymerase chain reaction (PCR) testing. For patient-level analyses, date of admission was used unless the infection was acquired in hospital, defined as symptom onset more than 7 days after admission, in which case date of symptom onset was used.

Notes on interpretation

FluCAN-PAEDS data reflect severe laboratory-confirmed acute respiratory infections requiring hospitalisation and may not be representative of all respiratory infections, hospital admissions, or populations across Australia. Hospital admissions reflect healthcare utilisation and admission practices and may be influenced by factors such as testing policies, clinical practice, and hospital capacity. Comparisons with previous years may be affected by differences in surveillance periods, noting that FluCAN-PAEDS was not conducted year-round before 2025, and case ascertainment practices over time.

Enhanced surveillance is conducted among children due to their increased risk of severe influenza. Consequently, children are overrepresented relative to the national hospitalised population and therefore paediatric and adult admissions are presented separately in the Australia Respiratory Surveillance Reports.

The distribution of sentinel hospitals varies by jurisdiction, with Vic contributing a larger proportion of admissions than other jurisdictions. Participating sentinel hospitals are predominantly located in major metropolitan centres, resulting in underrepresentation of regional and remote populations.

Short Period Incidence Study of Severe Acute Respiratory Infection (SPRINT-SARI) Australia

SPRINT-SARI Australia collects near real time data on the characteristics, outcomes, and interventions for patients admitted with severe acute respiratory infections to one of 75 participating intensive care sites across Australia. These intensive care sites include intensive care units and high dependency units managed by an intensive care team. In early 2020, SPRINT-SARI Australia was launched in response to the COVID-19 pandemic by the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANIZCS-CTG), the Australian and New Zealand Intensive Care Research Centre (ANZIC-RC), Monash University, and with international collaborators in Oxford. From March 2020 to May 2022, data were collected only on patients with an admission to intensive care associated with suspected or confirmed COVID-19. From June 2022 onwards, data collection began for other severe acute respiratory infection patients with an admission to intensive care for the management of acute respiratory failure or a complication and who were positive for a viral respiratory pathogen. From 2026 onwards, data collection began for other severe acute respiratory infection patients where the respiratory pathogen may be bacterial. This represents a shift in focus to more efficient to measure the impact of acute respiratory infections overall, rather than viral pathogens such as COVID-19 or influenza alone.

Notes on case definitions

Cases were defined as patients admitted to a participating intensive care or high dependency unit with acute respiratory failure (or its complications) and a laboratory-confirmed viral severe acute respiratory infection, including but not limited to COVID-19, influenza, parainfluenza or RSV. Date of admission was used for all patient analyses.

Cases were identified using routine diagnostic testing performed according to local clinical practice and hospital policy. Laboratory confirmation may be based on nucleic acid amplification tests (NAATs), including PCR, or immunoassays such as point-of-care tests. From July 2025, SPRINT-SARI no longer reported rhinovirus-only cases, reflecting a focus on respiratory pathogens of primary public health interest for severe acute respiratory infection surveillance. Sites that do not differentiate rhinovirus and enterovirus in laboratory reporting continue to report these cases.

Data are entered into an internationally standardised case report form by the research coordinator at the participating site and whenever possible, patient transfers were aggregated into one record to minimise duplicate reporting.

Notes on interpretation

SPRINT-SARI data reflect severe laboratory-confirmed acute respiratory infections requiring admission to an intensive care or high dependency unit and may not be representative of all respiratory infections, hospital admissions, or populations across Australia. Intensive care admissions reflect healthcare utilisation and admission practices and may be influenced by factors such as testing policies, clinical practice, and intensive care capacity. Differences in patient populations, referral pathways and intensive care admission practices between hospitals and jurisdictions may influence observed trends.

Comparisons with years prior to late 2022 should consider that surveillance initially focused on COVID-19 and did not routinely collect data on other viral severe acute respiratory infections.

Case ascertainment may vary between sites and over time due to differences in diagnostic testing practices, testing availability, local clinical protocols and admission criteria. Virological findings may be influenced by variation in testing approaches between participating sites.

Critical Health Resource Information System (CHRIS)

CHRIS is a real-time national system which provides data to monitor intensive care activity, capacity, and resourcing. In March 2020, in response to rising numbers of COVID-19 associated intensive care admissions, CHRIS was developed as a collaboration between the Australian and New Zealand Intensive Care Society (ANZICS) and Ambulance Victoria, funded by the Australian CDC. CHRIS receives data from all 191 adult and paediatric intensive care units (over 2,300 intensive care beds) across Australia. This includes public and private intensive care units.

Since 2020, CHRIS has collected data on the number of ventilated and non-ventilated COVID-19 cases occupying intensive care beds, as well as other resourcing data like intensive care staff availability. In late 2025, CHRIS began collecting information on the number of patients in intensive care who are in droplet or airborne isolation for any suspected or confirmed respiratory pathogen in each Australian state and territory. This change represents a shift in focus to provide a more accurate and reliable picture of how well the health care system is coping with co-circulating respiratory pathogens and the impact of acute respiratory infections on intensive care resources. In addition, a broader respiratory infection surveillance approach may provide an early warning signal for unusually severe influenza seasons, other changes in the epidemiology of respiratory infections in Australia, or a potential future epidemic or pandemic. Collecting this broader information also allows early identification of intensive care units under strain, reducing the risk of adverse patient outcomes.

Notes on definitions

Patients in intensive care who are in droplet or airborne isolation for any suspected or confirmed respiratory pathogen may include patients with:

COVID-19 or other seasonal coronaviruses, influenza, respiratory syncytial virus (RSV), severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), human metapneumovirus (hMPV), parainfluenza viruses, adenovirus, rhinovirus/enterovirus, pertussis (whooping cough), diphtheria, Group A Streptococcus, *Streptococcus pneumoniae* (pneumococcal pneumonia), tuberculosis, Q fever, atypical pneumonia, including *Mycoplasma pneumoniae, Chlamydia pneumoniae*, and *Legionella pneumophila*, as well as any patient presently in isolation within intensive care due to a suspected or confirmed respiratory pathogen.

It is acknowledged that practices related to isolation of intensive care patients (e.g. those with Epstein-Barr Virus (EBV), Cytomegalovirus (CMV), measles, mumps, rubella, Human Immunodeficiency Virus (HIV) or other immunocompromised patients with respiratory symptoms) may vary in different institutions. This may contribute to very small numbers of other patients recorded as being in droplet or airborne isolation.

Unavailable intensive care staff include both medical and nursing staff.

Date of report is used for all analyses.

Notes on interpretation

Occupancy is a measure of health system utilisation and reflects the number of patients in respiratory isolation at a given time, rather than the number of new patients with an acute respiratory infection. Patients placed in respiratory isolation can remain recorded as occupying an intensive care bed for several consecutive days. Occupancy levels may also be influenced by differences in admission practices, bed availability, infection prevention and control requirements, and models of care between hospitals and jurisdictions. Consequently, comparisons over time or between jurisdictions may reflect changes in health service delivery and resource utilisation, in addition to changes in disease activity.

NSW isolation data from public hospitals includes all patients occupying intensive care beds in isolation precautions, including those in contact isolation precautions, rather than just droplet or airborne isolation precautions. For this reason, the average number of patients occupying intensive care beds in droplet or airborne isolation will be overestimated. NSW data is therefore not comparable to other jurisdictions.

Staff unavailability may be influenced by local workforce management and return-to-work policies, which can vary between hospitals and jurisdictions. Staff unavailability is likely underestimated in NSW because most public hospitals in NSW do not routinely report these data.

Mortality surveillance

Australian Bureau of Statistics (ABS) Provisional Mortality Statistics

The ABS Provisional Mortality Statistics are sourced from the Registry of Births, Deaths and Marriages and are the primary data source for monitoring acute respiratory infection associated deaths in the Australian Respiratory Surveillance Reports. The ABS mortality data are separate from the NNDSS. The ABS Provisional Mortality Statistics provides an early indication of the pattern of mortality. The Provisional Mortality Statistics are nationally representative and there is standardisation in the collection, processing, classification, and presentation of causes of death statistics.[13]

Notes on definitions

Deaths involving acute respiratory infections are where the death was *due to* the disease (the illness has caused terminal complications such as pneumonia) or the person has died *with* the disease (a person has died from

another cause but the illness still contributed significantly to death). People are more likely to die *due to* COVID-19 or influenza than *with* these infections, whereas the opposite is observed for RSV.[14] To provide a comprehensive assessment of the mortality impact of acute respiratory infections, both deaths *due to* and *with* are presented in this report.

The ABS assigns an underlying cause of death for all deaths using international coding rules applied to conditions recorded on the medical certificate of cause of death. The underlying cause of death is the disease, condition or external event that initiated the sequence of events leading to death, and only certified conditions can be coded. The International Classification of Diseases 10th Revision (ICD-10) is used to classify causes of death in Australia and support international comparability of mortality statistics. In this report, deaths involving (both *due to* and *with*) COVID-19 were identified using ICD-10 codes U07.1–U07.2, U10.9 and U09.9; influenza using J09–J11; and RSV using J12.1, J20.5, J21.0 and B34.8 with B97.4 as an associated cause.[13] Definitions are explained in more detail throughout the online methodology.

Notes on interpretation

The Provisional Mortality Statistics provide preliminary death counts by date of occurrence and are subject to revision. State and territory Registrars of Births, Deaths and Marriages supply death registration data to the ABS for processing, coding and compilation. Due to registration delays, reported monthly deaths include both recent deaths and deaths that occurred in preceding months. For doctor-certified deaths, approximately 95% of registrations are received within two months of death, providing sufficient completeness for comparison with historical trends, although data for the most recent two months should be interpreted with caution.[13]

Deaths involving acute respiratory infections include all deaths where COVID-19, influenza or RSV were recorded on the death certificate, regardless of whether the infection was the underlying cause of death or a contributing condition. These data are useful for monitoring emerging trends; however, counts for recent periods are expected to increase as further registrations are received and processed by the ABS.[14]

The Provisional Mortality Statistics will not be comparable with those reported in Deaths, Australia or Causes of Death, Australia. The Provisional Mortality Statistics may also not be comparable with other data sources. Differences are explained in more detail throughout the Provisional Mortality Statistics methodology.

Laboratory surveillance

Sentinel laboratories

Sentinel laboratories are a surveillance network that provides data on diagnostic testing for respiratory pathogens. The system is not intended to capture all respiratory testing performed in Australia, but to provide a representative sample of respiratory virus testing activity and detections. Participating sentinel laboratories included the National Influenza Centres in NSW, Vic and WA, and networks in SA (SA Pathology) and Tas (Hobart Pathology, Launceston Pathology, North West Pathology and Royal Hobart Hospital Pathology). The National Influenza Centres undertake specialised influenza surveillance and contribute representative specimens and virus isolates to the WHO CCRRI for antigenic and genetic characterisation and influenza vaccine strain selection.

Notes on definitions

Laboratory testing data include the number of tests performed, positive test results and respiratory viruses detected by participating sentinel laboratories.

Notes on interpretation

Laboratory detections depend on who is tested and may not reflect the true incidence of infection in the community. Participating laboratories are not evenly distributed across jurisdictions and may not fully represent testing patterns or circulating respiratory pathogens in the broader Australian population.

Testing activity and pathogen detections are influenced by healthcare-seeking behaviour, clinician testing practices, laboratory testing protocols, availability of diagnostic tests and public health recommendations. Changes in these factors over time may affect comparisons between jurisdictions and seasons.

AusTrakka

In 2020, AusTrakka was developed to better facilitate public health genomics data sharing and analysis. AusTrakka is Australia's national pathogen genomic sequence and analysis platform for SARS-CoV-2 and coordinator of genomics outbreak investigations across jurisdictions. In 2025, laboratories in NSW, Qld, SA, Tas, Vic and WA provided SARS-CoV-2 genomic sequences and associated epidemiological metadata for national genomic surveillance and analysis. AusTrakka is overseen by the Communicable Diseases Genomics Network and the Public Health Laboratory Network.

Notes on definitions

Sequences are aggregated by week and reported using specimen collection date rather than sequencing date.

SARS-CoV-2 lineages were classified using the Phylogenetic Assignment of Named Global Outbreak (Pango) nomenclature. Lineage definitions evolve over time and classifications may be updated retrospectively as additional sequences become available and lineage designations are revised,[15] which may result in differences between the data presented here and in other reports.

From 2023, AusTrakka has used the WHO designations for any variant of concern, variant of interest, or variant under monitoring. AusTrakka determines variants of concern from a viral sequence by using the NextClade Pangolin software and scorpio algorithm, which assigns a sequence to a Pangolin constellation (the presence of a set of characteristic mutations for each variant of concern lineage). Non-variant of concern lineages are determined using the Pangolin software PangoLEARN.[15] This approach aligns with the WHO position on variant of concern classification and interpretation.

Notes on interpretation

Data represent sequenced SARS-CoV-2 samples and should not be interpreted as the number of reported COVID-19 cases, as not all cases undergo sequencing, and duplicate sequences may be present. Only samples with sufficient viral genetic material can be successfully sequenced. Specimens with low viral loads, those collected late in illness episode (common in returned travellers), or those subjected to suboptimal storage conditions may be underrepresented.

The representativeness of genomic surveillance has changed over time due to declining PCR testing, reduced referral of positive specimens for sequencing, and changes in sequencing strategies across jurisdictions.

Sequencing methodologies, laboratory protocols and sampling strategies differ between jurisdictions. The ACT and NT ceased routine SARS-CoV-2 sequencing from July 2023, while several jurisdictions reduced sequencing volumes, which may affect the comparability and representativeness of national genomic surveillance data. In addition, sequenced samples are not randomly selected. Since late 2022, sequencing has increasingly focused on hospitalised cases, intensive care admissions, outbreak investigations, and cases of clinical or public health significance. Consequently, sequenced samples may not be representative of all SARS-CoV-2 infections in Australia.

WHO CCRRI

In Australia, the WHO CCRRI, hosted by the Victorian Infectious Diseases Reference Laboratory, receives representative influenza viruses from laboratories across Australia for antigenic, genetic and antiviral susceptibility characterisation. The role of the WHO CCRRI is to obtain, isolate, and preserve representative viruses from cases of influenza, and characterise their antigenic, genetic, and drug sensitivity properties. The WHO CCRRI forms an important part of the WHO Global Influenza Surveillance and Response System.

Notes on definitions

Influenza viruses were classified by type, subtype or lineage using virological, antigenic and genetic characterisation methods. Influenza A viruses were classified by subtype (A(H1N1)pdm09 and A(H3N2)), while influenza B viruses were classified by lineage and genetic clade where available.

Antiviral susceptibility was assessed using neuraminidase inhibitor resistance testing. For influenza A viruses, highly reduced inhibition is defined as a ≥100-fold shift in IC50 (50% inhibitory concentration) in a neuraminidase inhibition assay. For influenza B viruses, highly reduced inhibition is defined as a ≥50-fold shift in IC50 in a neuraminidase inhibition assay.

Antigenic characterisation was performed using haemagglutination inhibition (HI) assays and assessed against WHO vaccine reference viruses. Low reactor viruses were viruses that show ≥8-fold reduction compared to the HI titre obtained with the reference virus and antisera.

Notes on interpretation

Data are based on a small subset of influenza-positive specimens submitted for further characterisation. Viruses selected for characterisation are not randomly sampled and may overrepresent viruses of particular epidemiological, clinical or public health interest. Consequently, subtype or lineage distributions may not reflect the distribution of all circulating influenza viruses. In addition, the representativeness of characterised viruses may be influenced by sampling strategies, specimen referral practices and testing capacity across jurisdictions.

Vaccine coverage, effectiveness and match

Together, vaccine coverage, effectiveness and match help assess the reach of a vaccination program, how well a vaccine is protecting people, and whether a vaccine remains well suited to circulating strains.

Vaccine coverage is the proportion of a population (or percentage) that has received a vaccine within a specified period and is used to assess uptake, identify groups or areas with lower vaccination rates, and monitor progress towards population-level protection. Coverage is typically measured using immunisation registers (like the Australian Immunisation Register), administrative data, or surveys.

Vaccine efficacy is measured in controlled clinical trials, where participants are carefully selected, monitored, and vaccinated under ideal conditions. Vaccine efficacy may differ from effectiveness because real-world conditions are more variable than clinical trial settings. Vaccine efficacy is not reported in the Australian Respiratory Surveillance Report series.

Vaccine effectiveness (VE) measures how well the vaccine performs in real-world populations, where people vary in age, health status, immune response, vaccine uptake, and adherence to vaccination schedules. It measures how well a vaccine prevents illness, hospitalisation, or death under real-world conditions. It may vary between populations and seasons and, for influenza, is influenced by how closely the vaccine strains match circulating viruses. Vaccine effectiveness is monitored by several sentinel surveillance systems in Australia or estimated from observational studies. Outcomes may include disease incidence, or other measures such as general practice attendance with disease, or hospital admission with disease.

Vaccine match describes the similarity between vaccine strains and circulating strains. A closer match generally improves vaccine performance and is assessed through virological surveillance of circulating viruses.

More information about immunisation in Australia is available in the Australian Immunisation Handbook.

Australian Immunisation Register (AIR)

The AIR is a national register that records vaccines given to all people in Australia, hosted by the Australian Government Department of Health, Disability and Agein. The AIR includes vaccines given:

- under the National Immunisation Program
- through school programs
- privately, such as for seasonal influenza or travel.

The register was initially established in 1996 as the Australian Childhood Immunisation Register using demographic data for all Medicare enrolled children aged < 7 years. In 2016, the Australian Childhood Immunisation Register expanded to become the AIR, to record vaccinations given from birth to death to all people in Australia. Participation is 'opt-out', so it constitutes a nearly complete population register for Australian residents. Immunisation data are transferred to the register when a recognised Australian-based immunisation provider supplies details of an eligible vaccination.

Calculation of the AIR Population (denominator for vaccine coverage)

For most National Immunisation Program (NIP) vaccine coverage measures, the denominator population (the population eligible for vaccinations) is derived from the Medicare-registered population maintained within the AIR. The Medicare-registered population is updated continuously to reflect changes in registration status, demographic details, residential address information, end-dated records, and the assignment of new Medicare numbers. Population estimates include individuals with active Medicare records at the end of the reference year and exclude duplicate records by retaining only the latest Medicare identifier for each individual. Geographic assignment is based on the current Medicare residential address, and age cohorts are constructed according to the requirements of the reporting measure.

This approach provides a comprehensive denominator population and has historically supported high-quality coverage estimates due to the near-complete population register for Australian residents.

Notes on definitions

Vaccine coverage was calculated as the number of Medicare-registered individuals with a valid Personal Identification Number (PIN) who received the relevant vaccine dose, divided by the total number of Medicare-registered individuals in the eligible population as described above. Records with a Synthetic Identification Number (SIN; Synthetic ID Number generated by Services Australia when the patient cannot be matched) were excluded from both numerator and denominator populations unless otherwise specified. Coverage for COVID-19 and influenza is measured for each calendar year. Individuals are considered covered if they have received one or more vaccination in a given calendar year. Coverage in the current year is rolling and will update throughout the calendar season.

Prior to July 6 2026, COVID-19 vaccine coverage was calculated using both using vaccinated individuals with either a PIN or SIN recorded in the AIR as the numerator and an ABS Estimated Residential Population as the denominator. Given the change in methodology, COVID-19 vaccine coverage estimates in reports from 6 July 2026 onwards may not be comparable to those published prior to 6 July 2026.

Individuals who became end-dated (deceased or permanently departed Australia) during the reporting year were excluded from vaccination counts and coverage estimates. Australian totals include records for which a state or territory could not be assigned.

For coverage, age is defined as the age of the individual on 1 July of a given year. This age reference period is used as there is a necessity to calculate people that are eligible for a vaccination in a season (to estimate coverage). The 1 July reference date represents the central point of the seasonal respiratory window and aligns with how current influenza reports have been developed.

The RSV Mother and Infant Protection Program (RSV-MIPP) commenced on 3 February 2025 and includes maternal vaccination (Abrysvo) and infant immunisation with nirsevimab (Beyfortus).[16] RSV coverage for antenatal protection is not estimated due to the inability to accurately measure the number of pregnant individuals in a given year. Infant coverage rates for nirsevimab are similarly not measured due to inability to identify babies that had received Abrysvo. Maternal vaccination data are presented as doses administered to Medicare-eligible females aged 15–54 years who received Abrysvo. Infant nirsevimab uptake is presented for infants aged <24 months who received nirsevimab in the preceding six months.

Notes on interpretation

The AIR is a near-complete population register; however, vaccination coverage and uptake estimates depend on accurate and timely reporting by immunisation providers. Estimates may be underestimated where records are reported late or not reported to the register. Mandatory reporting to the AIR commenced for COVID-19 vaccines on 20 February 2021, influenza vaccines on 1 March 2021, and all NIP vaccines on 1 July 2021.[17] Changes in reporting requirements over time may affect comparisons with previous years.

Coverage estimates may not fully capture people who are not enrolled in Medicare or whose records are incomplete. Estimates may also be affected by delays in updating records for deaths, overseas migration, or other changes in residency status.

Influenza and COVID-19 vaccination coverage estimates presented in this report may differ from estimates published elsewhere due to differences in reporting periods, calculation methodologies, denominator populations and data extraction dates. Methodological differences between calculation of influenza coverage and COVID-19 coverage should be considered when interpreting estimates and making comparisons between vaccine programs.

Jurisdiction-specific estimates are based on address information recorded in the AIR and may not always reflect a person's current place of residence. Australian totals include records for which a state or territory could not be assigned.

Reporting of RSV monoclonal antibodies to the AIR is not mandatory; therefore, uptake is likely to be underestimated. Comparisons of RSV uptake between jurisdictions and over time should be interpreted in the context of differences in vaccine eligibility, program implementation, reporting practices, product availability and the timing of RSV-MIPP rollout. As 2025 was the first year of RSV-MIPP implementation, uptake estimates may be influenced by phased program implementation and jurisdiction-specific delivery arrangements.[16]

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