

Surveillance systems reported in *CDI*, 2003

This article describes the surveillance schemes that are routinely reported on in *Communicable Diseases Intelligence (CDI)*.

In Australia, communicable diseases surveillance systems exist at national, state and local levels. State and local surveillance systems are crucial for the timely and effective detection and management of outbreaks. The national surveillance system combines a subset of data collected from state and territory-based systems to provide an overview at a national level. Specific functions of the national surveillance system include: detection and management of outbreaks affecting more than one jurisdiction; monitoring the need for and impact of national control programs; guidance of national policy development; and resource allocation and description of the epidemiology of rare diseases for which there are only a few notifications in each jurisdiction. National surveillance also assists in quarantine activities and facilitates international collaborations such as reporting to the World Health Organization.

Surveillance has been defined by the World Health Organization as the 'continuing scrutiny of all aspects of the occurrence and spread of disease that are pertinent to effective control'. It is characterised by 'methods distinguished by their practicability, uniformity, and frequently by their rapidity, rather than complete accuracy'.¹ Although some surveillance schemes aim for complete case ascertainment, others include only a proportion of all cases of the conditions under surveillance, and these samples may be subject to systematic and other biases. Results generated from surveillance schemes must be interpreted with caution, particularly when comparing results between schemes, between different geographical areas or jurisdictions and over time. The major features of the surveillance schemes for which *CDI* publishes regular reports are described below. Other surveillance schemes for which *Communicable Diseases Intelligence* publishes occasional reports include the National Mycobacterial Surveillance System (*Commun Dis Intell* 2002;26:525-536), the Australian Mycobacterium Reference Laboratory Network (*Commun Dis Intell* 2002;26:226-233).

National Notifiable Diseases Surveillance System

National compilations of notifiable diseases have been published intermittently in a number of publications since 1917.² The National Notifiable Diseases Surveillance System (NNDSS) was established in 1990 under the auspices of the Communicable Diseases Network Australia (CDNA) and is currently being re-developed.

The system coordinates the national surveillance of more than 50 communicable diseases or disease groups endorsed by the CDNA. Under this scheme, notifications are made from doctors and laboratories to state or territory health authorities under the provisions of the public health legislation in their jurisdiction. Computerised, de-identified unit records of notifications are supplied to the Department of Health and Ageing for collation, analysis and reporting in *CDI*.

Data provided for each notification include a unique record reference number, state or territory, disease code, date of onset, date of notification to the relevant health authority, sex, age, Indigenous status and postcode of residence. Additional data collected in the re-developed system includes infecting organism and subtype, the diagnosis method, full details of vaccination where appropriate, resident location as defined in the National Localities Index, dates of specimen collection, notification and date when notification was received by health authorities, Indigenous status defined as per the Australian Bureau of Statistics format, outbreak reference number, how the case was found, whether the case was confirmed, and whether the case was imported from overseas.

Aggregated data are presented on the *Communicable Diseases Australia* Internet site (www.cda.gov.au) each fortnight. Data are published in *CDI* every quarter and in an annual report. Cases reported to state and territory health authorities for the current reporting period are listed by state or territory, and totals for Australia are presented for the current period, the year to date, and for the corresponding periods of the previous year. A commentary on the notification data is included with the tables in the 'highlights' section of each issue of *CDI*.

HIV infection and AIDS notifications are not included in NNDSS. Surveillance for these conditions is conducted separately by the National Centre for HIV Epidemiology and Clinical Research and is reported in the HIV and AIDS surveillance reports (see below).

Australian Sentinel Practice Research Network

The Research and Health Promotion Unit of the Royal Australian College of General Practitioners operates the Australian Sentinel Practice Research Network (ASPREN). ASPREN is a national network of general practitioners who report presentations of defined medical conditions each week. Data collected provide an indicator of the burden of disease in the primary health care setting and are used to detect trends in consultation rates.

There are currently about 50 general practitioners participating in the network from all states. Seventy-five per cent of these are in metropolitan areas and the remainder are rural based. Between 4,000 and 6,000 consultations are recorded each week.

The list of conditions is reviewed annually by the ASPREN management committee and an annual report is published. In 2003, 13 conditions are being monitored, five are related to communicable disease issues. These include influenza, gastroenteritis, antibiotic prescription for acute cough, varicella and shingles. The other recordable conditions are aspirin prescription; micro-albumin testing in diabetes mellitus; steps 2 and 3 of the +++ asthma plan; corticosteroid prescription for asthma; and new diagnoses and recurrences or relapses of depression.

Data for communicable diseases are published in *Communicable Diseases Intelligence* every quarter. Data are presented in graphic format as the rate of reporting per 1,000 consultations per week. The conditions are defined as follows:

Influenza

- (a) Viral culture or serological evidence of influenza virus infection; or
- (b) influenza epidemic, plus four of the criteria in (c); or
- (c) six of the following:
 - sudden onset (within 12 hours);
 - cough;
 - rigour or chills;
 - fever;
 - prostration and weakness;
 - myalgia, widespread aches and pains;
 - no significant respiratory physical signs other than redness of nasal mucous membrane and throat;
 - influenza in close contacts.

Gastroenteritis

Intestinal disease presumed or proven to be infective in origin. A stool sample is not carried out and one episode only is recorded per patient.

Antibiotics for acute cough

Record any patient, two years or older, who is prescribed antibiotics for an acute cough of less than 14 days duration and at least one other symptom of a respiratory infection, such as symptoms of upper respiratory tract infection; sore throat; sputum production; dyspnoea; wheeze; or chest pain; for which there is no other explanation. This illness is usually labelled acute bronchitis, chest infection or lower respiratory tract infection.

Excludes

1. Patients that have a history of chronic respiratory illness that requires ongoing treatment, such as chronic obstructive pulmonary disease, bronchiectasis or asthma.
2. Patients with suspected or confirmed pneumonia.

Varicella/chickenpox

Any consultation at which varicella/chickenpox is diagnosed on clinical or other grounds.

Shingles

Any consultation at which shingles is diagnosed on clinical or other grounds.

HIV and AIDS surveillance

National surveillance for HIV and AIDS is coordinated by the National Centre in HIV Epidemiology and Clinical Research within the University of New South Wales, in collaboration with state and territory health authorities and the Commonwealth of Australia.

Cases of HIV infection are notified to the National HIV Database on the first occasion of diagnosis in Australia, either by the diagnosing laboratory (the Australian Capital Territory, New South Wales, Tasmania and Victoria) or by a combination of laboratory and doctor sources (the Northern Territory, Queensland, South Australia and Western Australia). Cases of AIDS are notified through the state and territory health authorities to the National AIDS Registry. To minimise duplicate notifications while maintaining confidentiality, diagnoses of both HIV infection and AIDS are notified with the person's date of birth and name code.

Currently, quarterly data presenting HIV infection diagnoses, AIDS diagnoses and AIDS deaths are published in each *CDI*. Tabulations of diagnoses of HIV infection and AIDS are based on data available three months after the end of the reporting period, to allow for reporting delay and to incorporate newly available information. Annual data are published on the *Communicable Diseases Australia* website.

Each year from 1997, the National Centre in HIV Epidemiology and Clinical Research has published *HIV/AIDS, viral hepatitis and sexually transmissible infections in Australia annual surveillance report*. The annual surveillance report, available through <http://www.med.unsw.edu.au/nchecr>, provides a comprehensive analysis and interpretation of surveillance data on HIV/AIDS, viral hepatitis and sexually transmissible infections in Australia.

Sentinel Chicken Surveillance Programme

The Sentinel Chicken Surveillance Programme is used to provide an early warning of increased flavivirus activity in Australia. The main viruses of concern are Murray Valley encephalitis (MVE) and Kunjin. MVE virus infection can cause the disease Murray Valley encephalitis (formerly known as Australian encephalitis), a potentially fatal disease in humans. Encephalitis is less frequent in cases of Kunjin virus infection and these encephalitis cases have a lower rate of severe sequelae.

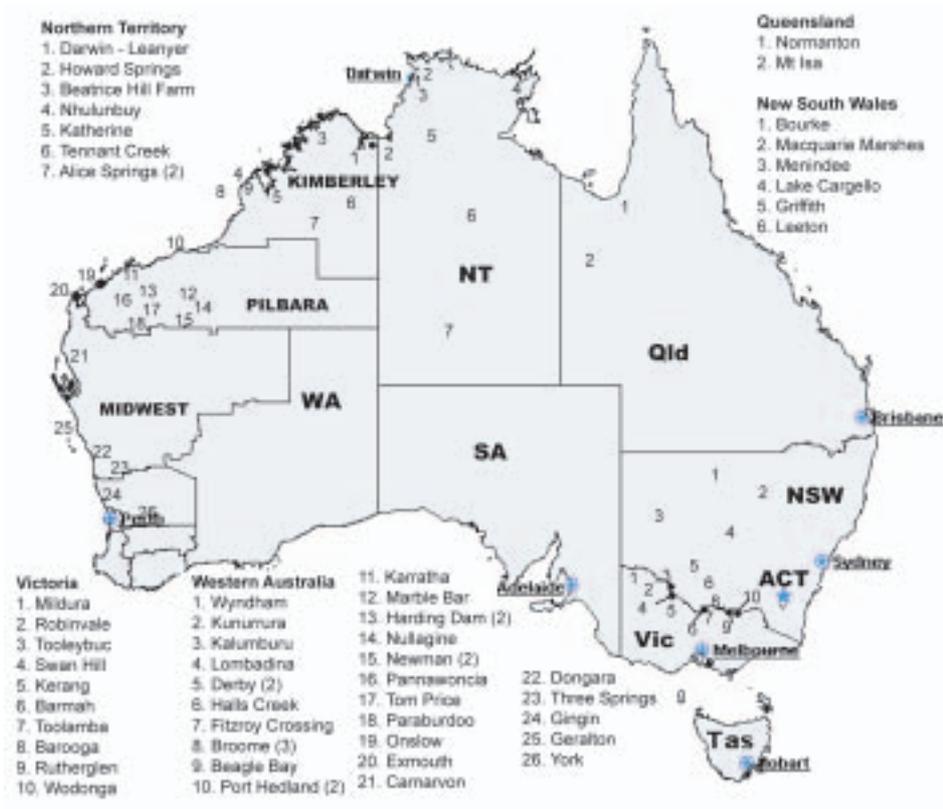
These viruses are enzootic in parts of the north-east Kimberley region of Western Australia and the Top End of the Northern Territory but are epizootic in other areas of the Kimberley, Pilbara, Gascoyne Murchison and Mid-west regions of Western Australia, in north Queensland and in Central Australia. MVE virus is also responsible for occasional severe epidemics of encephalitis in eastern Australia. The most recent was in 1974 when there were 13 fatalities and cases were reported from all mainland states.

Since then, 70 cases of MVE have been reported, 63 from the north of Australia and seven from central Australia. In addition, one case of encephalitis caused by MVE and/or Kunjin virus(es) was reported from the north of South Australia in 2000.

Since 1974, a number of sentinel chicken flocks have been established in Australia to provide an early warning of increased MVE virus activity. These programs are supported by individual state and territory health departments. Each jurisdiction has a contingency plan that will be implemented if one or more chickens in a flock seroconverts to MVE virus.

Currently, 32 flocks are maintained in the north of Western Australia, eight in the Northern Territory, six in New South Wales, 10 in Victoria and two in northern Queensland (Map). The flocks in Western Australia and the Northern Territory are tested all year round but those in New South Wales, Victoria and Queensland are tested only in the summer months, during the main MVE risk season. Results are posted on the *Communicable Diseases Australia Website*. A yearly summary is presented in *Communicable Diseases Intelligence*.

Map. Geographical distribution of sentinel chicken flocks for the surveillance of arboviruses, Australia, 2003



National Influenza Surveillance Scheme

Influenza surveillance in Australia is based on several schemes collecting a range of data that can be used to measure influenza activity.

- Since 2001, laboratory-confirmed influenza has been a notifiable disease in all Australian States and Territories and reported in the NNDSS (see above).
- In 2002, five sentinel general practitioner schemes contributed reports of influenza-like illness: the Australian Sentinel Practice Research Network, the Northern Territory Tropical Influenza Surveillance Scheme, the New South Wales Sentinel General Practice Scheme, the Victorian Sentinel General Practice Scheme and the Western Australia sentinel general practices.
- The Virology and Serology Laboratory Reporting Scheme (LabVISE) contributes laboratory reports of influenza diagnoses, including virus type.

The results of each of the schemes are published together fortnightly throughout the year on the *Communicable Disease Australia Website* as the National Influenza Surveillance Scheme.

Annual reports on influenza in Australia are published in *CDI* each year (*Commun Dis Intell* 2002;26:204-213). These reports include the above data as well as absenteeism data from a major national employer, hospitalisation and mortality data and influenza typing data from the World Health Organization Collaborating Centre for Influenza Reference and Research.

Australian Gonococcal Surveillance Programme

The Australian Gonococcal Surveillance Programme includes 10 reference laboratories in all states and territories and in New Zealand. These laboratories report data on sensitivity to an agreed core group of antimicrobial agents on a quarterly basis. The antibiotics which are currently routinely surveyed are the penicillins, ceftriaxone, ciprofloxacin and spectinomycin, all of which are administered as single dose regimens. When *in vitro* resistance to a recommended agent is demonstrated in 5 per cent or more of isolates, it is usual to reconsider the inclusion of that agent in current treatment schedules. Additional data are also provided on other antibiotics from time to time. At present all laboratories also intermittently test isolates for the presence of high level resistance to the tetracyclines and azithromycin. Comparability of data is achieved by means of a standardised system of testing and a program-specific quality assurance process. Expanded annual reports are published in *CDI* (*Commun Dis Intell* 2002;26:242).

Virology and Serology Laboratory Reporting Scheme

The Virology and Serology Laboratory Reporting Scheme began operating in 1977. The scheme comprises 15 laboratories from all states and the Australian Capital Territory. Contributors submit data fortnightly on the laboratory identifications of viruses and other organisms. Each record includes mandatory data fields (laboratory, specimen collection date, a patient identifier code, and organism), and optional fields (patient's sex, date of birth or age, postcode of residence, specimen source, clinical diagnosis, and the method of diagnosis).

Reports are collated, analysed and published quarterly. Each report includes summary tables of total numbers of organisms identified by state or territory and numbers of reports by month and participating laboratory. The delay between date of specimen collection and date of publication ranges from two weeks to several months.

Data derived from this scheme must be interpreted with caution. The number and type of reports received are subject to a number of biases. These include the number of participating laboratories, which varies over time. The locations of participating laboratories also create bias, as some jurisdictions are better represented than others. Changes in diagnostic practices, particularly the introduction of new testing methodologies, may affect laboratory reports. The ability of laboratory tests to distinguish acute from chronic or past infection must also be considered in interpretation of the data. Although changes in incidence cannot be determined with precision from these data, general trends can be observed, for example with respect to seasonality and the age-sex distribution of patients. (*Commun Dis Intell* 2002;26:323)

Australian Paediatric Surveillance Unit

The Australian Paediatric Surveillance Unit conducts nationally based active surveillance of rare diseases of childhood, including specified communicable diseases and complications of rare communicable diseases in children. The primary objectives of the APSU are to document the number of Australian children under 15 years newly diagnosed with specified conditions, their geographic distribution, clinical features, current management and outcome. Contributors to the Australian Paediatric Surveillance Unit are clinicians known to be working in paediatrics and child health in Australia. In 2001, over 1,000 clinicians participated in the surveillance of 15 conditions through the Australian Paediatric Surveillance Unit, with an overall response rate of 98 per cent.

The Australian Paediatric Surveillance Unit communicable diseases studies include: acute flaccid

paralysis, congenital cytomegalovirus infection, congenital rubella, HIV infection, AIDS and perinatal exposure to HIV, neonatal herpes simplex virus infection and hospitalised pertussis in infancy.

National Enteric Pathogens Surveillance System

The National Enteric Pathogens Surveillance System collects, analyses and disseminates data on human enteric bacterial infections diagnosed in Australia. These pathogens include *Salmonella*, *E. coli*, *Vibrio*, *Yersinia*, *Plesiomonas*, *Aeromonas* and *Campylobacter*. *Communicable Diseases Intelligence* quarterly reports include only *Salmonella*.

Data are based on reports to National Enteric Pathogens Surveillance System from Australian laboratories of laboratory-confirmed human infection with *Salmonella*. *Salmonella* are identified to the level of serovar and, if applicable, phage-type. Infections apparently acquired overseas are included. Multiple isolations of a single *Salmonella* serovar/phage-type from one or more body sites during the same episode of illness are counted once only. The date of the case is the date the primary diagnostic laboratory isolated a *Salmonella* from the clinical sample.

Australian Childhood Immunisation Register

Accurate information on the immunisation status of children is needed at the community level for program management and targeted immunisation efforts. A population-based immunisation register can provide this need. The Australian Childhood Immunisation Register (ACIR) commenced operation on 1 January 1996 and is now an important component of the *Immunise Australia Program*. It is administered and operated by the Health Insurance Commission (HIC). The Register was established by transferring data on all children under the age of seven years enrolled with Medicare from the HIC to the ACIR. This constitutes a nearly complete population register, as approximately 98 per cent of children are registered with Medicare by 12 months of age. Children who are

not enrolled in Medicare are added to the Register when a recognised immunisation provider supplies details of an eligible immunisation. Immunisations are generally notified to the HIC either by electronic means, the Internet or by paper ACIR notification forms. Immunisations recorded on the Register must have been given in accordance with the guidelines for immunisation determined by the National Health and Medical Research Council.

From the data finally entered onto the ACIR, the HIC provides regular quarterly coverage reports at the national and state and territory level. Coverage for these reports is calculated using the cohort method described in *Commun Dis Intell*, 1998;22:36-37. With this method, a cohort of children is defined by date of birth in three-month groups. This birth cohort has the immunisation status of its members assessed at the three key milestones of 12 months, 24 months and 6 years of age. Analysis of coverage is undertaken three months after the due date for completion of each milestone, so that time is available for processing notifications and the impact on coverage estimates of delayed notification to the ACIR is minimised. Only children enrolled with Medicare are included in order to minimise inaccuracies in coverage estimates due to duplicate records.

The HIC coverage reports for the three milestones are published in *CDI* each quarter. Coverage estimates are provided for each state and territory and Australia as a whole and for each individual vaccine assessed at each milestone. Changes in 'fully immunised' coverage from the previous quarter are also included in the tables.

A commentary on ACIR immunisation coverage estimates provided by the National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases is included with the tables in each issue.

References

1. Last JM. A dictionary of epidemiology. New York: Oxford University Press, 1988.
2. Hall R, Notifiable diseases surveillance, 1917 to 1991. *Commun Dis Intell* 1993;17:226-236.