abbreviation *Commun Dis Intell* to be consistent with that used by Medline citation.

Protection of patients' rights to privacy

Identifying details about patients should be omitted if they are not essential, but data should never be altered or falsified in an attempt to attain anonymity. Complete anonymity may be difficult to achieve, and written informed consent should be obtained if there is any doubt. Informed consent for this purpose requires that the patient be shown the manuscript to be published. When informed consent has been obtained it should be included in the article.

Contact details

Contributions and requests for further information should be sent to: The Deputy Editor, *Communicable Diseases Intelligenc*e, National Centre for Disease Control, MDP 6, GPO Box 9848, Canberra, ACT 2601.Telephone: (02) 6289 7240 Fax: (02) 6289 7791, Email: cdi.editor@health.gov.au

Surveillance data in *CDI*

The Communicable Diseases Surveillance section of *Communicable Diseases Intelligence* (*CDI*) includes reports from a number of national surveillance schemes. These schemes are conducted to monitor the occurrence of communicable diseases in Australia, to detect trends, to highlight needs for further investigation and to implement or manage control measures. This article describes the surveillance schemes that are routinely reported in *CDI*.

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, some include only a sample of all cases of the conditions under surveillance, and these samples are 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. Surveillance data may also differ from data on communicable diseases that may be gathered in other settings.

Other surveillance schemes for which *CDI* publishes *occasional* reports include the:

- National Mycobacterial Surveillance System (*CDI* 1999;23:337-348);
- Australian Mycobacterium Reference Laboratory Network *(CDI* 1999;23:349-353);
- National Neisseria Network (Gonococcal, *CDI* 1999;23:193-197 and Meningococcal, *CDI* 1999;23:317-323);
- WHO Western Pacific Gonococcal Antimicrobial Surveillance Programme (*CDI* 2000;24:1-4);
- Australian Paediatric Surveillance Unit (*CDI* 1998;24:283-287, and Acute Flaccid Paralysis *CDI* 1999;23:128-131);
- Australian National Polio Reference Laboratory (*CDI* 1999;23:124-128, and *CDI* 1999;23:324-327);
- Australian Malaria Register (*CDI* 1998;22:237-244); and
- Hib Case Surveillance Scheme (*CDI* 1997;21:173-176).

The major features of the surveillance schemes for which *CDI* publishes regular reports (either monthly or quarterly) are described below.

National Notifiable Diseases Surveillance System

National compilations of notifiable diseases have been published intermittently in a number of publications since 1917 (see *CDI* 1993;17:226-236). The National Notifiable Diseases Surveillance System (NNDSS) was established in 1990 under the auspices of the Communicable Diseases Network Australia New Zealand (CDNANZ). As of the November 1999 meeting a revised list of nationally notifiable diseases was agreed upon.

The system currently coordinates the national surveillance of more than 40 communicable diseases or disease groups endorsed by the National Health and Medical Research Council (NHMRC).[2] Under this scheme, notifications are made to the State or Territory health authority under the provisions of the public health legislation in their jurisdiction. Computerised, de-identified unit records of notifications are supplied to the network secretariat at the Department of Health and Aged Care for collation, analysis and publication in *CDI*.

Data provided for each notification include a unique record reference number, State or Territory code, disease code, date of onset, date of notification to the relevant health authority, sex, age, Aboriginality, postcode of residence, and the confirmation status of the report (as defined by each State or Territory).

Each fortnight, State and Territory health authorities submit a file of notifications received for the year to date; the data files therefore include notifications for both the current reporting period and updated notifications for all previous reporting periods in the current year.

The data are presented on the Communicable Diseases - Australia Internet site each fortnight (http://www.health.gov.au/pubhlth/cdi/cdihtml.htm). They are also published in *CDI* every four weeks. 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. HIV infection and AIDS notifications are not included in this section of *CDI*. 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).

A commentary with occasional graphs on the highlights of the notification data is included with the tables in each issue. The interval from the end of a reporting period to the date of publication of collated data in *CDI* is currently 15 days.

The quality and completeness of data compiled in the National Notifiable Diseases Surveillance System are influenced by various factors. Tables, graphs and commentary must be interpreted with caution, particularly when comparisons are made between States and Territories and with data from previous years. Each State or Territory health authority determines which diseases will be notifiable within its jurisdiction, and which notifications are accepted as satisfying criteria. In some cases these differ from the NHMRC case definitions. In addition, the mechanism of notification varies between States and Territories. Notifications may be required from treating clinicians, diagnostic laboratories or hospitals. In some cases different diseases are notifiable by different mechanisms. The proportion of cases seen by health care providers that are the subject of notification to health authorities is not known with certainty for any disease, and may vary among diseases, between jurisdictions and over time.

HIV and AIDS Surveillance

National surveillance for HIV and AIDS is coordinated by the National Centre in HIV Epidemiology and Clinical Research (NCHECR) 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 (Australian Capital Territory, New South Wales, Tasmania and Victoria) or by a combination of laboratory and doctor sources (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. Diagnoses of both HIV infection and AIDS are notified with the person's date of birth and name code, to minimise duplicate notifications while maintaining confidentiality.

Currently, two tables presenting HIV infection diagnoses, AIDS diagnoses and AIDS deaths are published in each issue of *CDI* when available.

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. A comprehensive analysis of current knowledge pertaining to the pattern of diagnosed HIV infection and AIDS in Australia, HIV prevalence and incidence in populations at lower and higher risk, patterns of treatment for HIV infection and estimates and projections of AIDS and HIV incidence is published annually in the report *HIV/AIDS, Hepatitis C and Sexually Transmissible Infections in Australia Annual Surveillance Report*.[3] The quarterly and annual surveillance reports are also available on the Internet (http://www.med.unsw.edu.au/nchecr).

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 on a number of conditions each week. The aim of ASPREN is to provide an indicator of the burden of disease in the primary health care setting and to detect trends in consultation rates.

There are currently about 120 general practitioners participating in the network from all States and Territories. Seventy-five per cent of these are in metropolitan areas and the remainder are rural based. Between 7,000 and 8,000 consultations are recorded each week.

The list of conditions is reviewed annually by the ASPREN management committee, and an annual report is published.

For 2000, 14 conditions are being monitored, five of which are related to communicable diseases issues.

These include first attendance for an episode of influenza, chickenpox, gastroenteritis and gastroenteritis with stool culture. ADT immunisations will also be recorded.

The other recordable conditions are: initial request for benzodiazepines, atrial fibrillation (with and without various anticoagulants), chronic fatigue syndrome, post-coital contraception and witnessed or suspected spider bite.

Data for communicable diseases are published every four weeks in *CDI.* For each of the four reporting weeks reviewed, the number of cases is presented in tabular form together with the rate of reporting per 1,000 consultations. Brief comments on the reports are included in the surveillance highlights section if appropriate. The case definitions are 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:

- (i) sudden onset (within 12 hours)
- (ii) cough
- (iii) rigors or chills
- (iv) fever
- (v) prostration and weakness
- (vi) myalgia, widespread aches and pains
- (vii) no significant respiratory physical signs other than redness of nasal mucous membrane and throat
- (viii) influenza in close contacts.

Chickenpox

An acute, generalised viral disease with a sudden onset of slight fever, mild constitutional symptoms and a skin eruption which is maculopapular for a few hours, vesicular for 3 to 4 days, and leaves a granular scab.

Gastroenteritis

Intestinal disease, presumed or proven to be infective in origin. A stool culture is *not* carried out. Recorded once only.

Gastroenteritis with stool culture

Intestinal disease, presumed or proven to be of infective origin. A stool culture is organised. Recorded once only.

Adult Diphtheria and Tetanus

Any consultation at which an Adult Diphtheria and Tetanus (ADT) immunisation is given.

Surveillance of Serious Adverse Events Following Vaccination

The Serious Adverse Events Following Vaccination Surveillance Scheme is a national surveillance scheme initiated through the National Childhood Immunisation Program. The scheme aims to identify and report in a timely fashion all serious adverse events which follow childhood vaccination. This permits the:

(a) identification of illnesses of infrequent occurrence that may be associated with vaccination;

(b) estimation of rates of occurrence of events temporally associated with vaccination;

(c) monitoring for unusually high rates of adverse events;

(d) provision of information to inform the debate on the risks and benefits of vaccines, and

(e) identification of areas that require further research.

The list of adverse events following vaccination has been revised for the 7th edition of *The Australian Immunisation Handbook* due to be released later this year. Currently, a serious adverse event following vaccination is defined as:

(a) The occurrence of one or more of the following conditions within 48 hours of the administration of a vaccine:
   (i) persistent screaming (for more than three hours)
   (ii) a temperature of 40.5^{o}C or more, unexplained by any other cause
   (iii) anaphylaxis
   (iv) shock
   (v) hypotonic/hyporesponsive episode, or

(b) the occurrence of one or more of the following conditions within 30 days of the administration of a vaccine:
   (vi) encephalopathy
   (vii) convulsions
   (viii) aseptic meningitis
   (ix) thrombocytopaenia
   (x) acute flaccid paralysis
   (xi) death
   (xii) other serious event thought to be associated with a vaccination.

The reporting process by which reports on serious adverse events are forwarded to the Department of Health and Aged Care is being reviewed. Reports are currently collected by State and Territory health authorities and forwarded to the Department of Health and Aged Care every fortnight. Information collected on each case includes the vaccine(s) temporally associated with the event, possible risk factors in the child's medical history and details about the nature, timing and outcome of the event. Methods of collecting reports vary between States and Territories. Telephone reporting is accepted to minimise health care provider paperwork. States and Territories also report on follow up at 60 days.

Reports of the surveillance scheme are published quarterly in *CDI*. Acceptance of a report does not imply a causal relationship between the administration of the vaccine and the medical outcome, or that the report has been verified as to its accuracy.

Australian Childhood Immunisation Register

The Australian Childhood Immunisation Register (ACIR) was established in January 1996 to monitor the immunisation status of Australian children under 7 years old. It is administered by the Health Insurance Commission for the Commonwealth Department of Health and Aged Care. Immunisation providers send information to the ACIR for collation. Data for *CDI* are presented quarterly according to 3 month birth cohorts, assessed at 1 year and 2 years of age for the NHMRC recommended childhood vaccination schedule vaccinations. Data are presented in a table for each cohort, by State, vaccination type, per cent fully immunised and change in per cent since last quarter. More information on the methodology is available in a *CDI* report.[4]

Sentinel Chicken Surveillance Programme

The Sentinel Chicken Surveillance Programme is used to provide an early warning of increased flavivirus activity in Australia. The two main viruses of concern are Murray Valley encephalitis (MVE) which causes the potentially fatal disease Australian encephalitis in humans and Kunjin virus which generally causes a milder form of disease (encephalitic or non-encephalitic) known as Kunjin virus disease . These viruses are enzootic in parts of the north-east Kimberley region of Western Australia and the Northern Territory but are epizootic in other areas of the Kimberley and in north Queensland. MVE virus is also responsible for occasional severe epidemics of Australian 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, 48 cases of Australian encephalitis have been reported and all but one of these were from the north of Australia.

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 health departments. Each State has a contingency plan which will be implemented if one or more chickens in a flock seroconverts to MVE virus.

Currently 27 flocks are maintained in the north of Western Australia, seven in the Northern Territory, nine in New South Wales and ten in Victoria (Figures 1, 2, 3 and 4). The flocks in Western Australia and the Northern Territory are tested all year round but those in New South Wales and Victoria are tested only in the summer months, during the main MVE risk season.

Figure 1. Sentinel chicken flock sites, Victoria

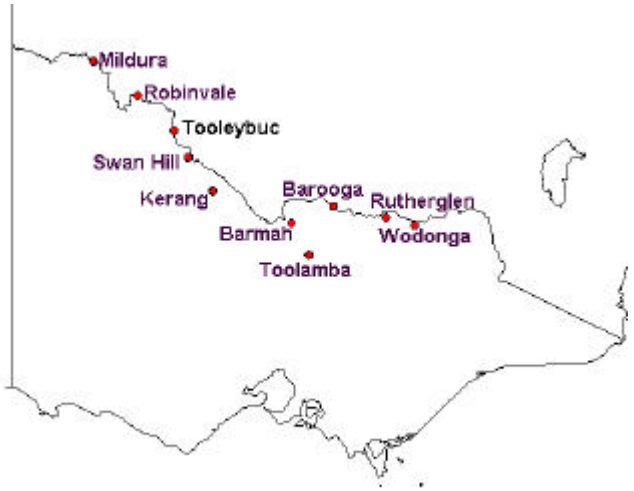
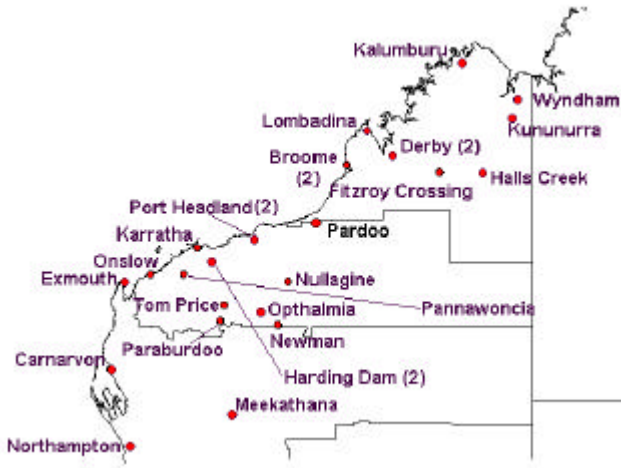


Figure 2. Sentinel chicken flock sites, Western Australia



Results are coordinated by the Arbovirus Laboratory in Perth and reported bimonthly.

Gonococcal surveillance

The Australian Gonococcal Surveillance Programme (AGSP) includes ten 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 quarterly. 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% 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 test isolates for the presence of high level resistance to the tetracyclines. Comparability of data is achieved by means of a standardised system of testing and a program-specific quality assurance process. Reports of the program are published quarterly and annually.

Figure 3. Sentinel chicken flock sites, New South Wales

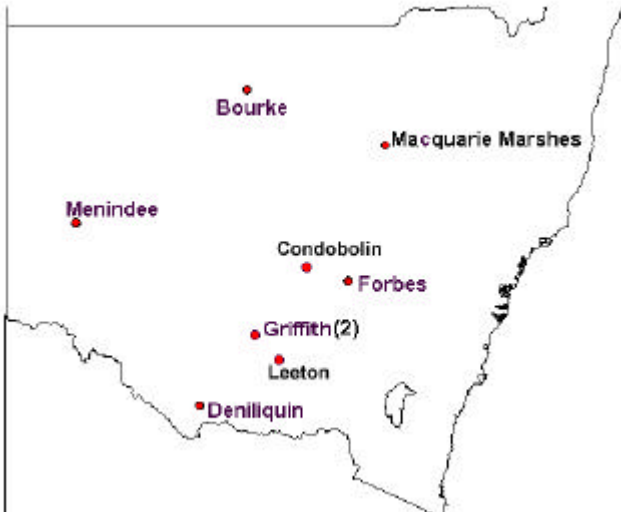
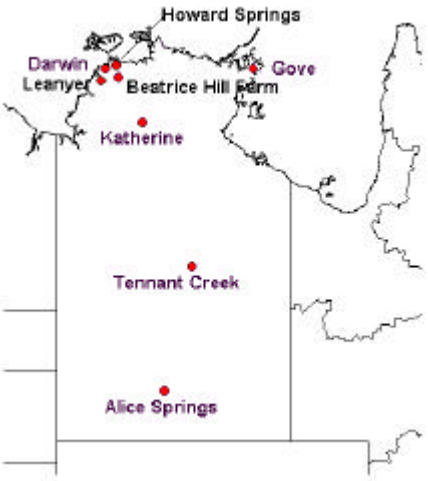


Figure 4. Sentinel chicken flock sites, Northern Territory



National Influenza Surveillance

Influenza surveillance in Australia is based on several schemes collecting a range of data that can be used to measure influenza activity. From autumn to spring, the results of each of the schemes are published together as the National Influenza Surveillance to facilitate a national view of influenza activity. An annual report is also presented.

In 1999, four sentinel general practitioner schemes contributed reports of influenza-like illness: the Australian Sentinel Practice Research Network, the Tropical Influenza Surveillance from the Northern Territory, the New South Wales Sentinel General Practice Scheme and the Victorian Sentinel General Practice Scheme. The number of cases of influenza and the total consultations for each week are reported (per 100,000 consultations), and a graph depicts the data for the season to date.

National absenteeism surveillance data are provided by Australia Post. Reports are based on the proportion of their employees (approximately 37,000) absent on sick leave for three consecutive days. This definition was changed from the previous one day absence to at least three days in 1999 to increase specificity. Absenteeism data for the reporting period is published in each issue.

The *CDI* Virology and Serology Laboratory Reporting Scheme contributes laboratory reports of influenza diagnoses, by week of specimen collection, virus type and method of diagnosis. Graphs of the data for the year to date are presented. The WHO Collaborating Centre for Influenza Reference and Research at the Commonwealth Serum Laboratories, Melbourne provides information, when available, on antigenic analysis of isolates received from Australia, New Zealand, other countries of the region and South Africa.

Virology and Serology Laboratory Reporting Scheme (LabVISE)

The Virology and Serology Laboratory Reporting Scheme began operating in 1977. Currently 15 State sentinel laboratories contribute data to the scheme. Contributors submit data on the laboratory identification of viruses and other organisms. Laboratories elect to submit data either on computer disk using LabVISE software (written in MS Access), or on paper forms in the same format. Each record includes mandatory data fields (laboratory, specimen collection date, a patient identifier code, sex, date of birth or age, post code of residence, and the agent detected), and optional fields (specimen code number and name, clinical diagnosis, method of diagnosis, risk factors and comments).

Reports are collated, analysed and published currently every four weeks. Each report includes two summary tables. The delay between date of specimen collection and date of publication ranges from two weeks to several months. A commentary on the laboratory reports is included in the surveillance highlights section when significant incidents or trends are observed. Data derived from this scheme must be interpreted with caution. The number and type of reports received is subject to a number of biases. These include the number of participating laboratories which has varied over time. The locations of participating laboratories also create bias, as some jurisdictions are better represented than others. Also 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.

This is a sentinel scheme with no denominator data, hence changes in incidence cannot be determined. However general trends can be observed, for example with respect to seasonality and the age-sex distribution of patients.

Rotavirus Surveillance

The National Rotavirus Reference Centre was established in July 1999 to undertake surveillance and characterisation of rotavirus strains that cause annual epidemics of severe diarrhoea in young children Australia-wide. The centre collects data and specimens from 12 sentinel centres that routinely test for rotavirus. The specimens are forwarded to The Royal Children's Hospital in Melbourne, where representative specimens are assigned a serotype/genotype using serological and molecular techniques. More details are presented in a short report in *CDI*.[5]

The Centre welcomes rotavirus data and specimens from all areas experiencing rotavirus disease Australia wide. The surveillance scheme will assemble data on the prevalence of rotavirus infection in children admitted to hospital with acute gastroenteritis, as well as identify circulating rotavirus serotypes in urban and regional centres Australia-wide. Rotavirus serotype findings will be reported in *CDI* three times per year.

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