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A community-wide hepatitis A outbreak in the Shoalhaven region, New South Wales

Timothy Heath[1,2], *Desolie Lovegrove*[3], *Victoria Westley-Wise*[3] *and Christine Roberts*[2]

Abstract

We investigated a community-wide outbreak of hepatitis A virus infection in the Shoalhaven region of the New South Wales south coast. Epidemiological features of the outbreak suggested that transmission was predominantly person-to-person. These included: the prolonged course of the epidemic, the bimodal age-specific attack rate, the lower socioeconomic risk groups affected, and the large proportion of cases who reported prior contact with another case. Although widespread use of post-exposure immunoprophylaxis appeared to be effective in preventing symptomatic infection in individuals, it did not rapidly halt the outbreak. We review methods of mass intervention for community-wide outbreaks of hepatitis A virus infection, and define priorities for investigation of future outbreaks. *Comm Dis Intell 1997;21:1-4.*

Introduction

The Shoalhaven is a coastal region in south-eastern New South Wales, and is one of four local government areas in the Illawarra Area Health Service (the Illawarra). The townships of Nowra and Bomaderry are located just north and south of the Shoalhaven River (combined population of 22,000). In late February 1996, the Illawarra Public Health Unit received the first of a series of notifications of hepatitis A virus (HAV) infection. Following 13 further HAV notifications over the following month, active surveillance was commenced in the Shoalhaven and surrounding districts, and an investigation was undertaken to examine whether the outbreak was caused by a common source, and whether any populations could be targeted for mass vaccination.

Methods

In late March, all general practitioners, hospital chief executive officers, emergency and infection control departments, and pathology laboratories in the Shoalhaven region were notified of the outbreak and asked to report new or suspected HAV infections. Cases were defined as persons who had either lived in or visited the Shoalhaven any time after 6 January 1996 (seven weeks prior to notification of the first case), with:

- Demonstration of HAV specific IgM in any single serum sample, or a four-fold rise in HAV IgG

1. Western Sector Public Health Unit, 13 New Street, North Parramatta New South Wales 2151
2. National Centre for Epidemiology and Population Health, Australian National University, Canberra
3. Illawarra Public Health Unit, Wollongong

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titres in sequential sera (a definite case); or

- Household contact of definite case and new onset of jaundice or abnormal liver function (elevated transaminases), or abdominal pain and fever (a probable case).

Adult cases were defined as those aged 18 years and over. A contact was defined as any person who stayed overnight in the same household, shared meals with a case in the same household, or was the sexual partner of a case during their infectious period. The infectious period of a case was defined as two weeks before until one week after onset of symptoms. All staff and children attending child-care centres were considered contacts if they were in proximity to a case during the case's infectious period.

Age, sex, Aboriginality, residential address, food handling, contact with child-care, hospital admission, mode and date of notification and diagnosis were recorded from interviews undertaken with all cases. A more detailed structured questionnaire was completed for 35 cases, which recorded case activities during the two to seven weeks prior to onset of symptoms, including known or suspected risk factors for HAV. We obtained HAV notification data for the years 1991 to 1995 from the New South Wales Health Infectious Diseases Surveillance System database.

Age-specific rates were calculated using the Australian Bureau of Statistics (ABS) estimated mid-year populations for 1994. ABS 1991 census data were used to calculate rates for the Aboriginal population, and to compare case demographics with the entire Shoalhaven population. Analyses were performed using Epi Info version 6.03.

Interventions

Regular updates of the outbreak's progress were sent to local general practitioners, hospitals and laboratories. Information sheets, which outlined HAV's mode of transmission and promoted hand washing, were distributed to cases, contacts, schools and workplaces. Information was also provided to the Aboriginal Land Council, Aboriginal health workers, and Nowra Community Health. All child-care centres in the area were reminded that HAV vaccination is recommended routinely for child-care workers, and efforts were made to make this available. In accordance with New South Wales Health guidelines, intramuscular normal human immunoglobulin (NHIG) was recommended for household, sexual, and child-care contacts of cases. In one child-care centre, where three definite cases of HAV occurred, NHIG was recommended for all 80 children and for all staff. The local council and Illawarra Public Health Unit issued press releases in early May, which explained the mode of transmission of HAV and promoted hand washing.

Results

To 20 May 1996, fifty-eight HAV cases were identified in the Shoalhaven, a crude rate of 76 per 100,000 population. This compared with 12 cases notified in the rest of the Illawarra Area Health Service during the same period, a rate of 3.3 per 100,000 population. During the preceding years 1991 to 1995, there had been five HAV notifications in the Shoalhaven region.

There were 55 definite and three probable cases. The progress of the outbreak up to 20 May is illustrated in Figure 1. Laboratories and doctors notified 52% and 40% of cases respectively; the remaining cases were notified by hospital infection control staff or were detected during case investigations. Most cases (64%) were residents of Bomaderry or Nowra, but smaller clusters were encountered in a number of neighbouring coastal townships. The sex distribution of cases was approximately equal (47% female). The median age was 19 years (range 2-55). The majority of cases were adults (52%), but notification rates were highest for children aged 5-14 years (Figure 2). Twenty-four were school children, and three were in child-care. Eighteen (31%) cases were Aboriginal, a rate of 1,200 per 100,000 Aboriginal population. No cases were commercial food handlers. Twelve (22%) were admitted to hospital.

The more detailed questionnaire found that respondents were more likely to be Aboriginal, living with children or with six or more people, or unemployed than the entire Shoalhaven population (Table). During the period that infection probably occurred - two to seven weeks prior to onset of symptoms - 18 (51%) cases had contact with another definite case. Although five cases had eaten raw oysters, these cases did not appear related to each other (the oysters were harvested from rocks at different sites along the Shoalhaven coastline). Recreational swimming was not a frequent

Figure 1. Hepatitis A cases in the Shoalhaven region, by week of notification, to 20 May 1996

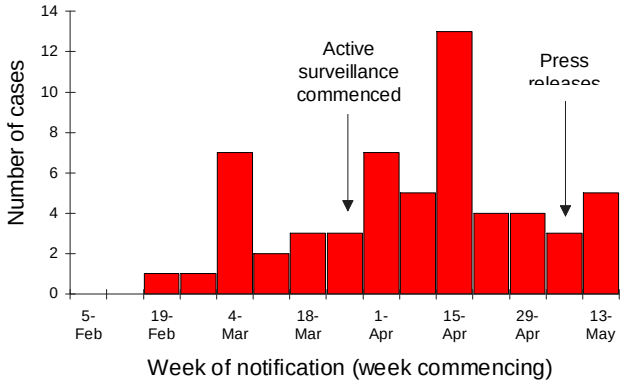
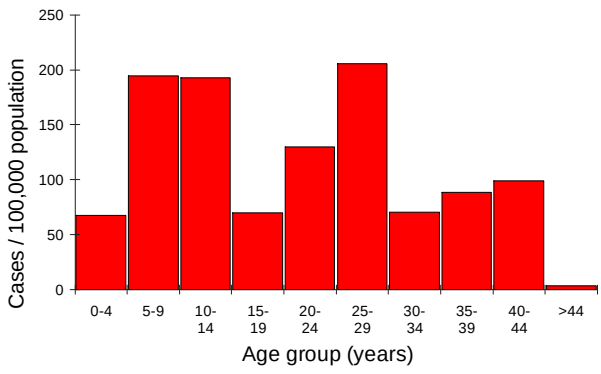


Figure 2. Hepatitis A notification rates by age group, Shoalhaven region, 1 January to 20 May 1996



exposure, and no two cases swam in the same pool, river, or at the same beach. Ten cases ate at restaurants during this period, but the maximum number eating in the same restaurant was four. Only one case had drunk unchlorinated ground water from a stream. No cases had received prophylactic NHIG in the three months preceding their illness, and none had travelled to hepatitis A endemic areas. All cases were Australian born.

Sixteen of the 35 cases were adults. Of these adults, six (37%) were also known to be hepatitis C virus (HCV) seropositive by enzyme immunoassay, and three (19%) gave a history of recent injecting drug use. Cases were not tested routinely for HCV seropositivity. Three of the six known HCV seropositive adults were admitted to hospital, but hospital admission was not significantly more frequent for HCV positive cases than for other adults (Fishers Exact Test; p=0.39). No cases reported being homosexual. Twelve adults (75%) were unemployed.

Table. Socio-demographic characteristics of hepatitis A outbreak survey respondents, compared to Shoalhaven population

Socio-demographic characteristic	Outbreak survey (n=35)	(%)	Shoalhaven[1] population %
Male	15	43	50
Aboriginal	8	23	2.2
School student	16	46	-
Living in a household with children:			
aged < 5 years	20	57	8.3[3]
aged < 2 years	12	34	-
who attend a child care centre	6	17	-
Live in house with six or more people	11	31	3.2[3]
Unemployed (adults[2] n=16)	12	75	16.5[4]

1. Australian Bureau of Statistics 1991 census.
2. Aged 18 years or over.
3. Per cent households.
4. Per cent labour force.

Discussion

Mode of transmission

Community-wide outbreaks of HAV infection are often prolonged and difficult to control. Usually they persist for six to 18 months, until the pool of susceptible persons is exhausted[1,2,3,4].We believe that person-to-person transmission was responsible for this community-wide outbreak of HAV infection in the Shoalhaven. Several epidemiologic features support this view. First, the rise and fall of the epidemic curve was characteristically slow. Second, the bimodal age-specific attack rate we observed, affecting children aged 5-14 years and young adults aged 25-29 years is typical of person-to-person transmission[1,5,6]. The dominant source of infection in community wide outbreaks is thought to be asymptomatic children under five years of age, especially those attending child care, who spread infection to their older siblings and parents. Third, as we observed in this instance, lower socioeconomic groups such as the unemployed, those living in large crowded households, and families with a large proportion of young children are often over represented in person-to-person transmitted outbreaks of HAV infection. Religious and ethnic minorities, Aboriginal populations, and injecting drug users (IDUs) are also at higher risk[1,2,5,6,7]. Fourth, the proportion of cases (51%) reporting prior contact with a definite case in this outbreak was typical of person to person transmission.[1,3,6,7]. We did not undertake extensive questionnaires looking for possible food sources, because the epidemiology of cases did not suggest a food-borne source. Food-borne outbreaks generally have a more abrupt onset, a more prominent peak, tend to affect the adult restaurant-going population, and are usually of shorter duration than outbreaks resulting from person-to-person transmission[8,9,10].

Six of the cases in this outbreak were known to be HCV seropositive, including three who reported recent injecting drug use (IDU). Other investigations have found that IDUs are at increased risk, although it is not clear why[7,11]. It may relate to increased faecal-oral transmission due to poor hygiene, or feasibly parenteral transmission of HAV may occur via unsterile injecting techniques. We noted that several cases in this outbreak reported the communal use of 'bongs' (marihuana smoking devices), and this could facilitate faecal-oral spread. We were unable to formally evaluate these hypotheses because of the small numbers of cases involved. Half of the HCV seropositive cases in this outbreak were hospitalised for severe hepatitic symptoms. Although there were few HCV cases in our study, it has been previously noted that IDUs with chronic hepatitis are more susceptible to severe hepatitis A[12].

Methods of hepatitis A outbreak control

Numerous studies have shown that post-exposure immunoprophylaxis using NHIG reduces the incidence and severity of HAV infection in contacts[1,13]. Symptomatic secondary infection is prevented in 90% of contacts who receive NHIG within ten days following exposure. Some have expressed concern that the efficacy of immunoprophylaxis may be reduced in developed countries, because the concentration of HAV specific IgG in NHIG is decreasing, although so far this has not been accompanied by reports of reduced efficacy[13,14]. During the Shoalhaven outbreak we did not observe any symptomatic infection amongst contacts who received standard dose NHIG prophylaxis within ten days of exposure.

Post-exposure NHIG does not appear to control established community-wide outbreaks of HAV infection. The Shoalhaven outbreak continued despite its widespread use. There has been one report of successful outbreak control using an 'expanded and targeted' program of post-exposure prophylaxis, where contacts of both suspected and confirmed cases were given NHIG[2]. However, our experience supports the more widely held view that while passive immunisation of contacts protects individuals, it does not halt an established community-wide outbreak[1,3,7]. This is probably

because a large proportion of infection occurs asymptomatically.

Because post exposure NHIG has failed to halt community-wide HAV outbreaks, mass administration of NHIG has been trialed. However, mass immunoprophylaxis has met with mixed enthusiasm, and its usefulness remains controversial. It does appear to be successful when there is a clearly defined population at risk, such as an individual school, child-care centre or an isolated community[4,15,16] . However, there are concerns that deferring HAV infection without providing lasting immunity may allow more severe HAV infection to occur later in adult life, and that the community remains susceptible to future outbreaks.

These concerns have prompted recent attempts to control HAV outbreaks by vaccinating entire communities using inactivated hepatitis A vaccines. Several uncontrolled interventional studies have reported promising results, suggesting that mass vaccination can prematurely halt outbreaks, and that a single dose of vaccine can achieve this[17,18,19]. One large scale study in Alaska showed that it was possible to halt outbreaks in communities where high immunisation coverage was achieved[18]. Another large campaign in the United States of America, which only targeted school children for vaccination, has also claimed success[17]. However, while theoretically attractive, it remains uncertain what effect single dose mass HAV immunisation will have upon long-term population immunity and HAV epidemiology.

Given the absence of well defined, accessible risk groups, should all school children in the Shoalhaven region have been vaccinated? There are approximately 12,000 children aged 5-14 years in the region, so even vaccinating this group would entail great cost and major logistic difficulties. The vaccine alone (Havrix, SmithKline Beecham) costs about $35 per dose - that is $420,000 for these children. Even so, it may be that mass vaccination is a worthwhile intervention for community-wide HAV outbreaks. Prospective estimation of the costs incurred by future community-wide HAV outbreaks would help in deciding whether mass vaccination is justifiable. In the absence of such data we decided against mass vaccination, and without a definitive intervention the outbreak continued for ten months. By October 1996, although the number of new cases appeared to be subsiding, the case count was 98, there were two instances of secondary spread from this outbreak to areas outside the Illawarra to Sydney and the Australian Capital Territory.

In the United States of America, universal childhood hepatitis A vaccination has been proposed, because it is thought that vaccinating adult risk groups will not reduce the majority of cases - asymptomatic children - and because it is believed to be the only strategy capable of eliminating HAV infection[20]. The advent of combination vaccines which include both HAV and hepatitis B antigens, if effective in infants, will make this approach more attractive.

Acknowledgements

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Surveillance data in *CDI*

Margaret Curran and Ana Herceg, National Centre for Disease Control, MDP 15, GPO Box 9848, ACT 2601

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 which are routinely reported on 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 which may be gathered in other settings.

The major features of the surveillance schemes for which *CDI* publishes regular reports are described below. Other surveillance schemes for which *CDI* publishes occasional reports include the National Mycobacterial Surveillance System (described in *CDI* 1996;20:108-115), the Australian Tuberculosis Laboratory Reporting Scheme (described in *CDI* 1995;19:343-345), the Hib Case Surveillance Scheme (described in *CDI* 1995;19:86-90) and the National *Neisseria* Network (*CDI* 1996;20:422-424).

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).

The System 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 Family Services 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 in *CDI* each fortnight in tabular form. 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 on the notification data is included with the tables in each issue and graphs are used to illustrate trends in the data.

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 which in some cases 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 which 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 of HIV infection diagnoses, AIDS diagnoses and AIDS deaths are published in alternate issues of *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. More detailed information on diagnoses of HIV infections and AIDS is published quarterly in the *Australian HIV Surveillance Report*, available from the 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 99 participating general practitioners in the Network from all States and Territories. Seventy-two of these are in metropolitan areas and 27 are rural based. Approximately 7,000 consultations are recorded each week.

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

For 1997, 12 conditions are being monitored. The communicable diseases included are influenza, rubella, measles, chickenpox, pertussis, Ross River virus, HIV testing (patient initiated), HIV testing (doctor initiated) and gastroenteritis. 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.

Rubella

(a) an acute exanthem with enlarged lymph nodes, most prominently suboccipital and post auricular, with a macular rash on the face, spreading to the trunk and proxmal portions of the limbs, or

(b) serological evidence of rubella infection.

Measles

(a) serological or virological evidence of acute measles, or

(b) two of the following:

(i) prodrome including infected conjunctivae, fever and cough

(ii) white specks on a red base in the mucous membranes of the cheek (Koplik's spots)

(iii) confluent maculopapular eruption spreading over the face and body, or

(c) an atypical exanthem in a partially immune person during an epidemic of measles.

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.

Pertussis

(a) Respiratory infection with a characteristic staccato paroxysmal cough ending with a high-pitched inspiratory whoop, or

(b) respiratory infection with persistent cough (3 weeks) in contact with known pertussis, or

(c) demonstration of *Bordetella pertussis*.

Ross River virus

A patient who presents with joint pain and lethargy and a history of exposure to mosquitoes.

All three must be present for a diagnosis of Ross River virus.

HIV testing (patient initiated)

Testing for HIV undertaken as a result of a patient request.

Note: Requests made by insurance companies for HIV testing should be excluded.

HIV testing (doctor initiated)

Testing initiated for a medical practitioner determined reason**.**

Note: Requests made by insurance companies for HIV testing should be excluded.

Gastroenteritis

Intestinal disease, presumed or proven to be infective in origin, recorded once only.

Data for communicable diseases are published fortnightly in *CDI*. For each of the two 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 accompany the table.

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 which

cause the potentially fatal disease Australian encephalitis in humans. 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 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 23 flocks are maintained in the north of Western Australia, nine in the Northern Territory, ten 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.

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

Figure 1. Sentinel chicken flock sites, Western Australia

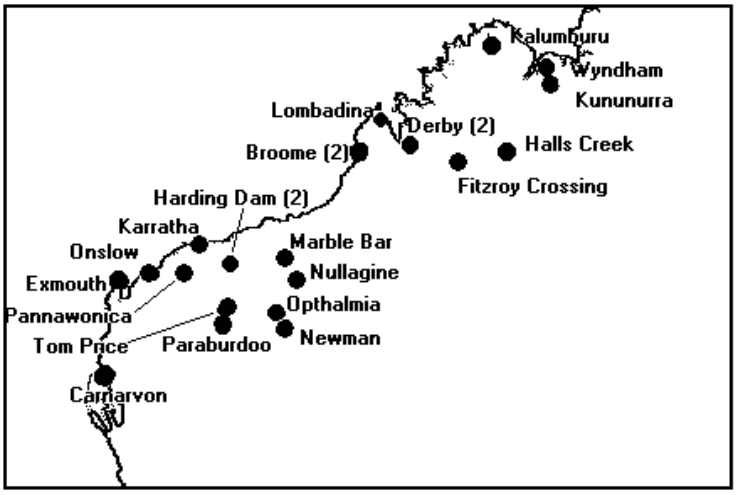


Figure 2. Sentinel chicken flock sites, Victoria

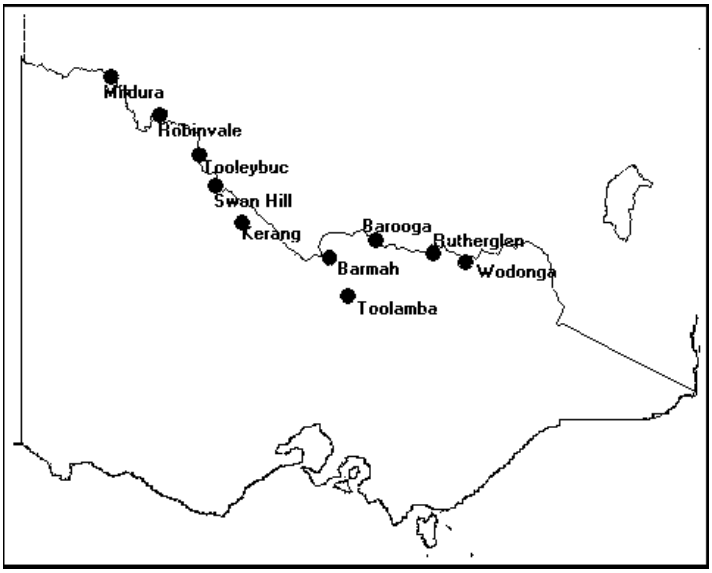


Figure 3. Sentinel chicken flock sites, New South Wales

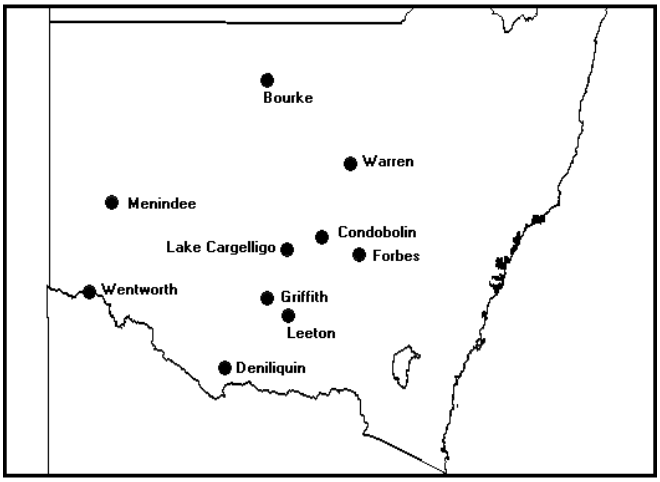
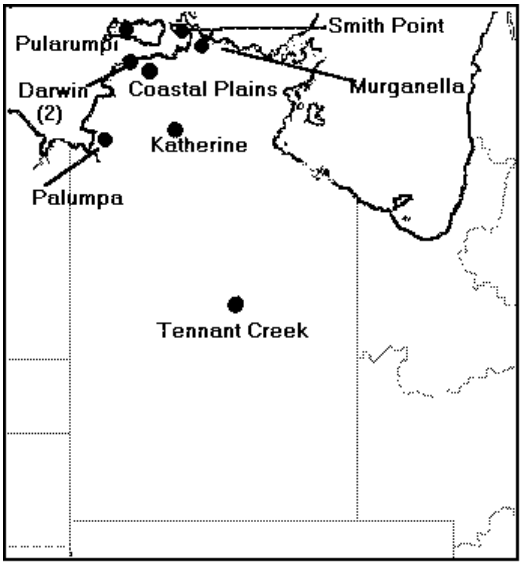


Figure 4. Sentinel chicken flock sites, Northern Territory



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 (i) the identification of illnesses of infrequent occurrence that may be associated with vaccination, (ii) the estimation of rates of occurrence of events temporally associated with vaccination, (iii) monitoring for unusually high rates of adverse events, (iv) the provision of information to inform the debate on the risks and benefits of vaccines and (v) the identification of areas that require further research.

A serious adverse event following vaccination is defined as:

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

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.

Reports on serious adverse events are collected by State and Territory health authorities and forwarded to the Department of Health and Family Services 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. 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.

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.

National Influenza Surveillance

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

In 1996, four sentinel general practitioner schemes contributed reports of influenza-like illness: the Australian Sentinel Practice Research Network, 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, 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 the 37,000 employees absent on sick leave for a selected day each week. A graph of the absenteeism data for the year to date is published each fortnight.

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 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. The scheme comprises 21 sentinel laboratories from all States and the Australian Capital Territory. 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 Epi Info), or on paper forms in the same format. Each record includes mandatory data fields (laboratory, specimen collection date, a patient identifier code, specimen source, the agent detected and the method of diagnosis), and optional fields (specimen code number, sex, date of birth or age, postcode of residence, clinical diagnosis, risk factors and comments).

Reports are collated, analysed and published currently each fortnight.

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 includes the observation of recent trends with accompanying graphical presentation.

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 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.

References

1. Last JM. *A dictionary of epidemiology.* New York: Oxford University Press, 1988.
2. National Health and Medical Research Council. *Surveillance Case Definitions.* Canberra: NHMRC, 1994.

CDI Instructions for authors

Communicable Diseases Intelligence (*CDI*) is a fortnightly publication of the National Centre for Disease Control, Commonwealth Department of Health and Family Services and the Communicable Diseases Network Australia. Its aim is to provide timely information about communicable diseases in Australia to those with responsibility for their control. *CDI* has a particular emphasis on public health issues.

CDI invites contributions dealing with any aspect of communicable disease incidence, risk factors, surveillance or control in Australia. Submissions can be in the form of original articles, short reports, surveillance summaries, reviews or correspondence.

On receipt of an article, *CDI* sends a brief acknowledgment indicating that it will be considered for publication. The article will then undergo a review process which may include peer review by two experts in the topic area. Articles may be rejected without peer review. Occasionally reports of urgent public health importance may be published immediately, at the discretion of the Editor. Authors may be asked to revise articles as a result of the review process and the final decision about publication is made by the Editor.

CDI is published on alternate Thursdays except for the fortnight of Christmas-New Year. It is finalised for printing on the Monday prior to the publication date. Very topical brief contributions (for example reports of current outbreaks) may be published in the fortnight of receipt, by arrangement with the editorial staff.

Submission procedure

A single copy of the contribution should be submitted to The Editor, *Communicable Diseases Intelligence*, at the address below. A covering letter should identify the corresponding author and be signed by all authors agreeing to possible publication.

The contribution should be provided in hard copy and on diskette (3 ½ inch disks preferred). WordPerfect text format is ideal, although most IBM-compatible word processing formats can be converted. Short contributions may also be sent by email.

Authors

Authors of articles should be identified by their first name, last name, institution and address, with phone and fax contacts for the corresponding author. Each author should have participated sufficiently to take public responsibility for the article. Others contributing to the work should be recognised in the acknowledgments.

Articles and short reports

The text of articles should be structured to contain abstract, introduction, methods, results, discussion, acknowledgments and references, as far as is possible. Short contributions may need fewer subsections. There is no strict word limit for articles but manuscripts of 2,000 words or less are preferred. A word count should be included with the contribution.

Tables and figures

All tables and figures should be referred to within the results section and should not duplicate information in the text. If graphs are to be included, the numerical data on which these are based should also be provided to enable production in house style. Black and white illustrations or photographs can be included if required.

References

References should be identified consecutively in the text by the use of superscript numbers. The Vancouver reference style is used by *CDI* (see International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. *Med J Aust* 1991;155:197-201). All unpublished material should be referred to within the text (instead of the reference list) as personal communication or unpublished observation. The only exception is material which has been accepted for publication (in press).

Contact details

Contributions and requests for further information should be sent to: The Acting Editor (Dr Ana Herceg), *Communicable Diseases Intelligence*, National Centre for Disease Control, MDP 15, GPO Box 9848, Canberra, ACT 2601. Telephone: (06) 289 8638 Fax: (06) 289 7791 Email: ana.herceg@hhlgcs.ausgovhhcs.telememo.au

Communicable Diseases Surveillance

National Notifiable Diseases Surveillance System

The NNDSS is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The system coordinates the national surveillance of more than 40 communicable diseases or disease groups endorsed by the National Health and Medical Research Council (NHMRC). Notifications of these diseases are made to State and Territory health authorities under the provisions of their respective public health legislations. De-identified core unit data are supplied fortnightly for collation, analysis and dissemination. For further information, see CDI 1997;21:5.

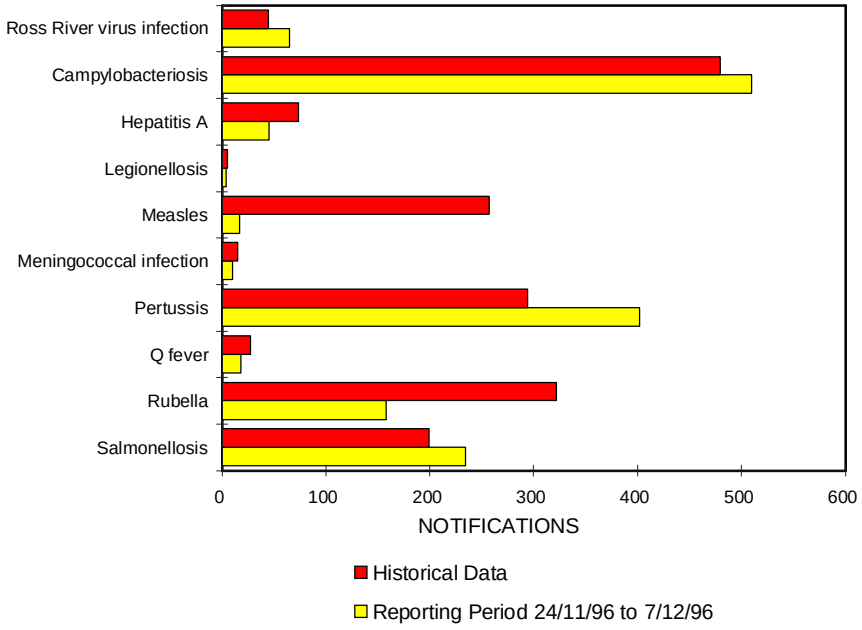
Reporting period 24 November to 7 December 1996

There were 1,873 notifications received for this two-week period (Tables 1, 2 and 3). The numbers of reports for selected diseases have been compared with average data for this period in the previous three years (Figure 1).

Five hundred and ten notifications of campylobacteriosis were received in this period. The 0 - 4 years age group accounted for 106 of these and reports of infection in this age group are the most frequent (Figure 2).

One hundred and thirty-five cases of gonococcal infection were reported in this period. Ninety-five of these (70%) were for persons in the 15 - 34 years age group. The

Figure 1. Selected National Notifiable Diseases Surveillance System reports, and historical data[1]



1. The historical data are the averages of the number of notifications in 9 previous 2-week reporting periods: the corresponding periods of the last 3 years and the periods immediately preceding and following those.

Table 1. Notifications of diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 24 November 1996 to 7 December 1996

Disease[1,2]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1996	This period 1995	Year to date 1996	Year to date 1995
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0
Haemophilus influenzae type B	0	1	0	0	0	0	1	0	2	4	50	65
Measles	2	5	0	6	0	0	4	0	17	39	479	1281
Mumps	0	1	0	NN	2	0	5	1	9	10	121	147
Pertussis	6	88	0	51	100	5	129	23	402	184	3827	4074
Rubella	2	8	0	64	45	1	21	17	158	324	2559	4020
Tetanus	0	0	0	0	0	0	0	0	0	1	2	5

NN Not Notifiable.

1. No notifications of poliomyelitis have been reported since 1986.

2. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision, so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.

Table 2. Notifications of other diseases received by State and Territory health authorities in the period 24 November 1996 to 7 December 1996

Disease[1,2]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1996	This period 1995	Year to date 1996	Year to date 1995
Arbovirus Infection (NEC)[3,4]	0	0	0	1	0	0	0	1	2	1	96	66
Barmah Forest virus infection	0	2	-	10	0	0	0	-	12	22	760	735
Ross River virus infection	0	15	6	22	2	0	2	18	65	46	7705	2569
Dengue	0	0	0	0	0	-	0	1	1	2	40	31
Campylobacteriosis[5]	9	-	2	201	82	30	85	101	510	523	11201	10247
Chlamydial infection (NEC)[6]	8	NN	34	139	0	9	77	57	324	281	7024	5995
Donovanosis	0	NN	0	0	NN	0	0	1	1	1	46	75
Gonococcal infection[7]	1	17	18	26	0	0	14	59	135	137	3638	2991
Hepatitis A	1	21	2	6	2	1	7	5	45	87	2058	1475
Hepatitis B incident	0	1	0	0	0	1	0	1	3	17	183	307
Hepatitis C incident	0	2	0	-	0	0	-	-	2	2	36	67
Hepatitis C unspecified	13	NN	17	92	NN	5	22	36	185	430	8521	9152
Hepatitis (NEC)	0	1	0	0	0	0	0	NN	1	0	18	12
Legionellosis	0	1	0	2	1	0	0	0	4	6	169	153
Leptospirosis	0	2	0	1	0	0	2	0	5	15	217	137
Listeriosis	0	0	0	0	0	0	1	2	3	0	63	53
Malaria	1	1	1	9	1	0	2	0	15	7	800	593
Meningococcal infection	0	6	0	2	0	1	1	0	10	16	401	366
Ornithosis	0	NN	0	0	0	0	0	0	0	15	68	160
Q Fever	0	7	0	10	0	0	0	1	18	22	492	452
Salmonellosis (NEC)	2	65	9	83	10	4	27	34	234	199	5417	5602
Shigellosis[5]	0	-	2	9	8	0	3	2	24	22	621	703
Syphilis	0	20	7	12	0	0	0	0	39	52	1384	1746
Tuberculosis	2	16	2	3	1	0	10	4	38	57	1046	997
Typhoid[8]	0	1	0	0	0	0	0	0	1	3	76	68

1. For HIV and AIDS, see *CDI* 1996;20:548. For rarely notified diseases, see Table 3 .
2. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
3. Tas: includes Ross River virus and dengue.
4. NT, Vic and WA: includes Barmah Forest virus.
5. NSW: only as 'foodborne disease' or 'gastroenteritis in an institution'.
6. WA: genital only.
7. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
8. NSW, Vic: includes paratyphoid.

NN Not Notifiable.
NEC Not Elsewhere Classified.
- Elsewhere Classified.

Table 3. Notifications of rare[1] diseases received by State and Territory health authorities in the period 24 November to 7 December 1996

Disease[2]	Total this period	Reporting States or Territories	Year to date 1996
Brucellosis	1	Qld	35
Chancroid			1
Cholera			4
Hydatid infection			42
Leprosy			9

1. Fewer than 60 cases of each of these diseases were notified each year during the period 1988 to 1995.
2. No notifications have been received during 1996 for the following rare diseases: botulism lymphogranuloma venereum; plague; rabies; yellow fever; or other viral haemorrhagic fevers.

Figure 2. Campylobacteriosis notifications, 1995 and 1996, by age group and sex

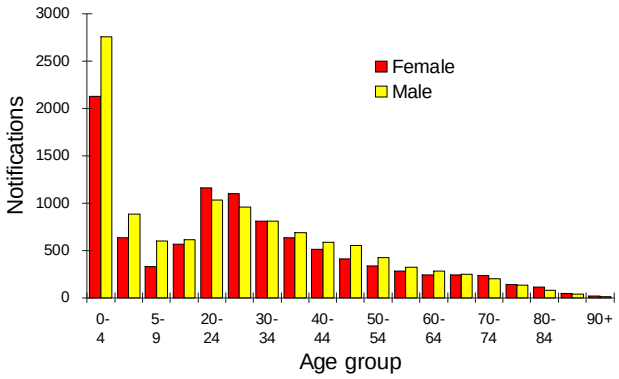


Figure 3. Pertussis notifications, 1994 to 1996, by month of onset

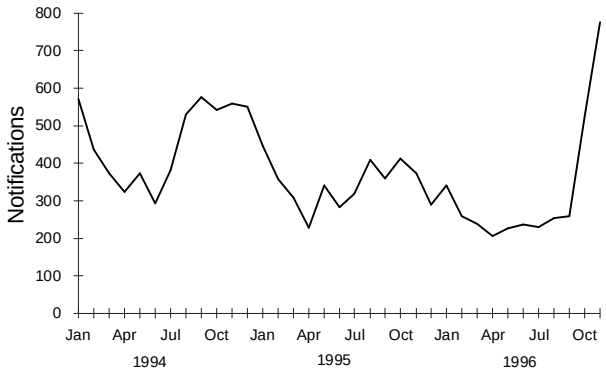
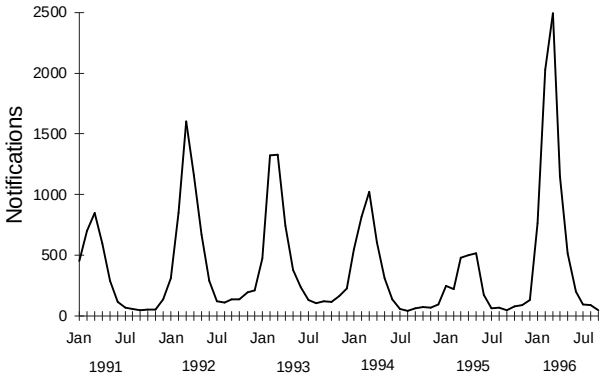


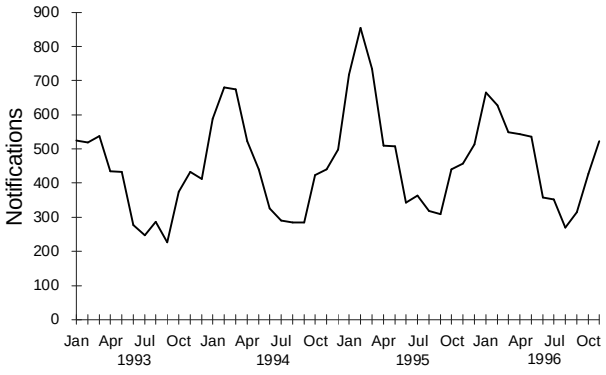
Figure 4. Ross River virus notifications, 1991 to 1996, by month of onset



male:female ratio was 2.0:1. Thirty cases were reported from the Statistical Division of Kimberley, Western Australia, 20 from the Northern Territory, 15 from Sydney and 13 from Perth.

Pertussis was reported for 402 persons in this period. Eighty-one and 96 cases were seen in the 5 - 9 years and 10 - 14 years age groups respectively. Included were 20 apparent clusters of 3 or more cases in postcode regions of New South Wales (3), Victoria (6), Queensland (2), South Australia (8) and Western Australia (1). There has been a sharp increase in the number of notifications in recent months. However, total notifications for the year to date are less than those seen in 1994 or 1995 (Figure 3).

Figure 5. Salmonella notifications, 1993 to 1996, by month of onset



Sixty-five notifications of Ross River virus were received in this period. The majority of cases (77%) were in persons aged 20 - 54 years. Numbers remain low but are expected to increase in January (Figure 4).

There were 158 cases of rubella reported in this period. The number of notifications continues to be below the level reported for the same period in recent years. Eighty-six cases were aged between 15 and 29 years. There was a predominance of males, with the male:female ratio being 1.7:1.

Salmonellosis was reported for 234 persons in this period. Eighty-seven of the cases were in the 0 - 4 years age group. Included were 6 apparent clusters of 3 or more cases in postcode regions of New South Wales (3), Queensland (2), and Western Australia (1). The number of notifications has increased since August . This is expected, with notifications usually peaking in summer. (Figure 5).

Australian Sentinel Practice Research Network

The Australian Sentinel Practice Research Network (ASPREN) comprises 99 sentinel general practitioners from throughout the country. A total of approximately 9,000 consultations are recorded each week for 12 conditions. Of these, CDI reports the consultation rate for influenza, rubella, measles, chickenpox, pertussis and gastroenteritis. For further information including case definitions see CDI 1997;21:6.

Table 4. Australian Sentinel Practice Research Network reports, weeks 48 and 49, 1996

Condition	*Week 48, to 1 December 1996*		*Week 49, to 8 December 1996*	
	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters
Influenza	16	2.4	20	3.0
Rubella	4	0.6	4	0.6
Measles	0	0	0	0
Chickenpox	16	2.4	16	2.4
Pertussis	5	0.8	3	0.4
Gastroenteritis	117	17.7	124	18.5

Data for weeks 48 and 49 ending 1 and 8 December respectively are included in this issue of *CDI* (Table 4). The consultation rate for influenza-like illness has remained at relatively low levels since the beginning of October. There has been no appreciable change in the consultation rate for gastroenteritis over recent months. Consultation rates for chickenpox for weeks 48 and 49 were lower than for the previous four weeks. The numbers of reported cases of rubella and pertussis have remained low. Only three cases of measles have been reported since the beginning of May.

LabVISE

The Virology and Serology Laboratory Reporting Scheme, LabVISE, is a sentinel reporting scheme. Twenty-one laboratories contribute data on the laboratory identification of viruses and other organisms. Data are collated and published in Communicable Diseases Intelligence each fortnight. These data should be interpreted with caution as the number and type of reports received is subject to a number of biases. For further information, see CDI 1997;21:8-9.

There were 1,542 reports received in the *CDI* Virology and Serology Laboratory Reporting Scheme in this period (Tables 5 and 6).

Thirty-one reports of Ross River virus were received in this period. Reports usually begin to rise for the season in December and January, peaking in March.

A total of 87 laboratory reports of rubella were received this fortnight, all diagnosed by IgM detection. Included were 67 males and 20 females, 6 of whom were of childbearing age. Reports peaked in October, as was the case in previous years.

Seventy-nine reports of untyped adenovirus were received this period. The number of reports received has fallen in recent months after peaking in September (Figure 6).

Influenza A was reported for 37 patients this period. Included were 22 males and 13 females (2 sex not stated). Fifteen reports were for patients over the age of 65 years. Diagnosis was by virus isolation (3), four-fold rise in titre (one) and single high titre (33). The number of reports remains low which is usual for the time of year (Figure 7).

The number of reports of parainfluenza virus type 3 remained high through November (Figure 8). A total of 149 reports were received in this reporting period, most of which were from Queensland, Western Australia and Victoria. Forty-six patients (31%) were under one year of age and 98 (66%) were under the age of 5 years. Methods of diagnosis included virus isolation (96), antigen detection (25), single high titre (27) and four-fold rise in titre (one).

Figure 6. Adenovirus (untyped) laboratory reports, 1995 to 1996, by month of specimen collection

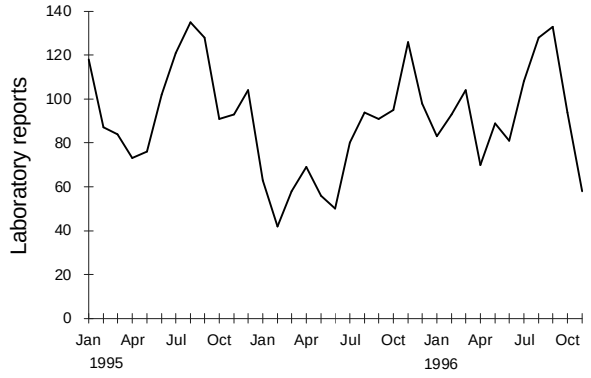


Figure 7. Influenza A laboratory reports, 1994 to 1996, by month of specimen collection

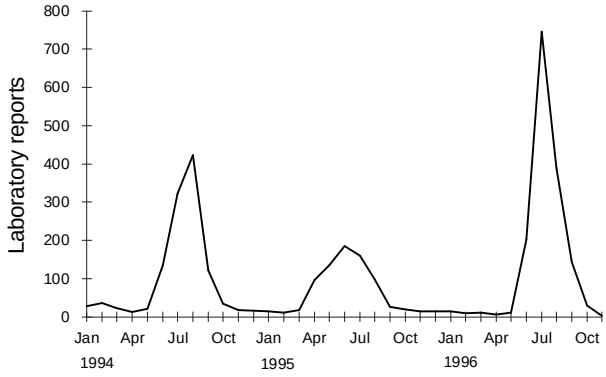


Figure 8. Parainfluenza virus type 3 laboratory reports, 1995 to 1996, by month of specimen collection

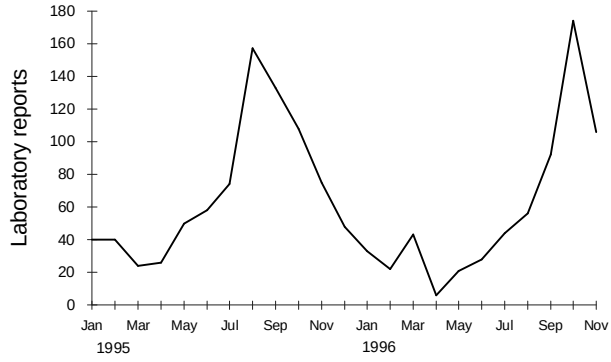


Table 5. Virology and serology laboratory reports by State or Territory[1] for the reporting period 28 November to 11 December 1996, historical data[2], and total reports for the year

	State or Territory[1]								Total this fortnight	Historical data[2]	Total 1996
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA			
Measles, mumps, rubella											
Measles virus			2	1				2	5	27.0	58
Mumps virus				1				3	4	3.5	41
Rubella virus			1	51	16		1	18	87	98.5	787
Hepatitis viruses											
Hepatitis A virus			2		2			13	17	23.0	393
Hepatitis D virus				2					2	1.2	20
Arboviruses											
Ross River virus			6	9	2			14	31	20.5	3174
Barmah Forest virus			2	3				5	10	10.2	218
Dengue not typed							1	2	3	.8	16
Adenoviruses											
Adenovirus type 1					3		1		4	2.5	17
Adenovirus type 2					2	1		1	4	3.2	35
Adenovirus type 3								1	1	6.2	70
Adenovirus type 7					1				1	2.5	25
Adenovirus type 35							1		1	.0	3
Adenovirus type 40								3	3	.0	33
Adenovirus not typed / pending		4	1	12	4		15	43	79	63.7	1366
Herpes viruses											
Cytomegalovirus	1			18	5		10	15	49	72.3	1487
Varicella-zoster virus		1		22	3		14	30	70	56.8	1172
Epstein-Barr virus		6	5	51	31		4	64	161	101.5	2120
Other DNA viruses											
Molluscum contagiosum								1	1	.2	6
Parvovirus			1	22	2		12	2	39	7.7	257
Picornavirus family											
Coxsackievirus A7					1				1	.0	1
Coxsackievirus A16							1		1	.0	7
Coxsackievirus B3							1		1	1.8	2
Coxsackievirus B4					1				1	.0	7
Coxsackievirus B untyped / pending								1	1	.0	3
Echovirus type 7					1		1		2	.0	14
Echovirus type 15					1				1	.0	1
Echovirus type 18					1				1	.2	1
Poliovirus type 2 (uncharacterised)							1		1	1.8	17
Poliovirus type 1 (vaccine strain)					1				1	.0	1
Rhinovirus (all types)		1		25			8	37	71	43.0	730
Enterovirus not typed / pending				24			3	38	65	49.3	836
Ortho/Paramyxoviruses											
Influenza A virus								37	37	9.3	1538
Influenza B virus					5			5	10	3.7	66
Parainfluenza virus type 1		1	1		4			4	10	.7	314
Parainfluenza virus type 2								2	2	1.0	72
Parainfluenza virus type 3		4	1	71	8		28	37	149	48.5	806
Respiratory syncytial virus		1		3		1	13	11	29	40.2	4116
Other RNA viruses											
HTLV-1			1					1	2	.0	9
Rotavirus		1			15	10	10	24	60	69.5	1605

Table 5. Virology and serology laboratory reports by State or Territory[1] for the reporting period 28 November to 11 December 1996, historical data[2], and total reports for the year, continued

	State or Territory[1]								Total this fortnight	Historical data[2]	Total 1996
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA			
Norwalk agent							4		4	3.8	42
Other											
Chlamydia trachomatis not typed		5	43	60	29	1	7	132	277	125.3	3786
Chlamydia psittaci							2	1	3	12.3	86
Chlamydia species		1							1	2.7	52
Mycoplasma pneumoniae		17		20	8		15	61	121	21.5	894
Coxiella burnetii (Q fever)		2		4			1	8	15	14.3	194
Rickettsia australis				1			1		2	1.8	20
Rickettsia tsutsugamushi				1					1	.2	14
Bordetella pertussis				1			42	34	77	26.0	776
Bordetella species				21					21	18.7	296
Legionella longbeachae								2	2	.2	17
Leptospira species		1		3					4	1.7	63
Schistosoma species			1				1	9	11	7.3	244
TOTAL	1	45	68	426	146	13	198	828	1,542	1,006.	27440

1. State or Territory of postcode, if reported, otherwise State or Territory of reporting laboratory.
2. The historical data are the averages of the numbers of reports in 6 previous 2 week reporting periods: the corresponding periods of the last 2 years and the periods immediately preceding and following those.

Table 6. Virology and serology laboratory reports by contributing laboratories for the reporting period 28 November to 11 December 1996

State or Territory	Laboratory	Reports
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	25
	Royal Alexandra Hospital for Children, Camperdown	12
Queensland	Queensland Medical Laboratory, West End	205
	State Health Laboratory, Brisbane	129
South Australia	Institute of Medical and Veterinary Science, Adelaide	146
Tasmania	Northern Tasmanian Pathology Service, Launceston	12
Victoria	Microbiological Diagnostic Unit, University of Melbourne	7
	Royal Children's Hospital, Melbourne	125
	Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital	67
Western Australia	PathCentre Virology, Perth	630
	Princess Margaret Hospital, Perth	54
	Western Diagnostic Pathology	130
TOTAL		1542

Overseas briefs

Source: World Health Organization (WHO)

Cholera

Rwanda. A total of 106 cases and 10 deaths have been reported since 16 November in Runda transit camp, 20 km from Kigali. WHO is supporting the Ministry of Health in follow up and close monitoring of diarrhoeal diseases at commune level, particularly among recent returnees.

Zaire. A total of 1,133 cases and 23 deaths have occurred in Goma Hospital since 16 November and the local WHO epidemiologist reports that the number of cases has now stabilised.

E.coli O157 infection, Scotland

Between 22 November and 11 December 1996, 396 suspected cases of *E.coli* 0157 infection were reported to the Scottish Centre for Infection and Environmental Health. A total of 216 cases have been confirmed, with 11 deaths in adults. The source of the outbreak has been attributed to consumption of meat products.

Ebola haemorrhagic fever, Gabon

Fifty-two cases of Ebola haemorrhagic fever have been detected through active surveillance and contact tracing in the outbreak which was declared on 10 October. Forty cases have died. The last death occurred in a hospital in the capital Libreville on 30 December 1996. This death was of the last identified case, which had an onset of illness on 21 December. On 2 January 1997, three cases were still in hospital in Booué. Surveillance and monitoring of contacts included 92 persons in Booué and 93 in Libreville.

Influenza, global situation at 3 January 1997

By mid-December influenza had reached epidemic levels in France, in parts of Spain (Madrid region and central-northern regions), the western and south-western parts of Switzerland and in the far eastern region of Russia. Marked increases had been reported in England. In the rest of Europe, influenza had not yet made much more than sporadic appearances. In North America, increases had been registered in all regions of the United States of America and there had been a marked increase in the number of laboratory confirmed cases in Canada. Local outbreaks had been recorded in Japan.

The laboratory confirmed cases during the first three months of the 1996-1997 influenza season were mostly influenza A. Almost all those further subtyped were of H_3N_2 subtype and appear to be close the strain recommended for inclusion in the influenza vaccine. Influenza A has been confirmed in Canada, French Guiana, Guadeloupe and USA in the Americas; Belgium, Czech Republic, Finland, France, Iceland, Italy, Latvia, Netherlands, Norway, Portugal, Russian Federation, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom in Europe; in Hong Kong, and Japan in Asia; Israel in the Middle East; and in New Zealand and Madagascar. Influenza B has been much less common but sporadic isolates have been reported in Australia, Canada, Chile, Hong Kong, Iceland, Latvia, Norway, Portugal, Romania, Spain, Sweden, Switzerland, the United Kingdom and the United States of America. Influenza A (H_1N_1) has been reported from Canada and the Russian Federation.

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